



MONTGOMERY COUNTY MARYLAND
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY SERVICES

SNOW SUMMIT 2012-2013

Bethesda Depot
1283 Seven Locks Road, Rockville, Maryland

November 1, 2012

Today's Agenda

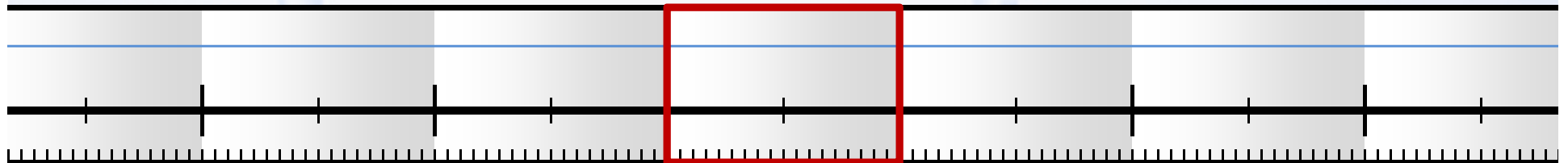
- Welcome Remarks
- Introductions
- Review of Seasonal Activities
 - Pre-Season
 - Pre-Storm
 - Period of Storm
 - Post Storm
 - Post Season
- Wrap-up

Snow Summit Objective

- Inform public and private sectors of DOT procedures for management of the 2012-2013 Snow Season
- Public Outreach
 - Inform the public
 - Inform elected officials
 - Transparency
 - Manage public expectations
 - Temper public expectations
 - Provide reliable information
 - Real-time information
 - YouTube, Twitter, CATV Channel 6



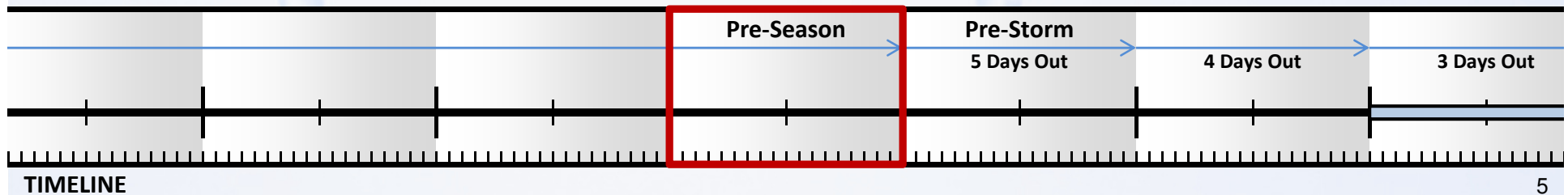
Pre-Season



TIMELINE

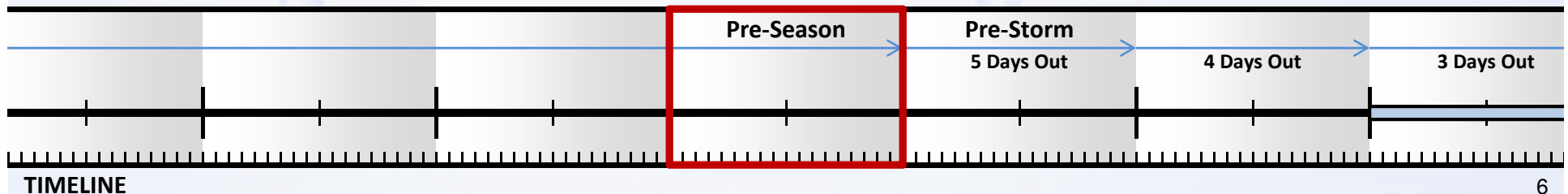
Storm Readiness

- When you consider the term "storm readiness;" it's really an all year activity which includes:
 - planning
 - coordinating
 - training staff
 - preparation of equipment
 - contracts solicitation
 - materials acquisition
- Key Initiatives



Storm Readiness Key Initiatives

- TomTom® Plow Route Navigation
 - Provides turn by turn navigation
 - Increases efficiency
 - Reduces missed streets
 - Portable
 - Used in contract vehicles and County trucks
 - This Initiative received the County Engineers Association of Maryland (CEAM) Small Award of Merit for 2012
 - DOT was named a winner of the 2012 National Association of Counties (NACo) Achievement Awards for this Initiative.



Storm Readiness

Key Initiatives

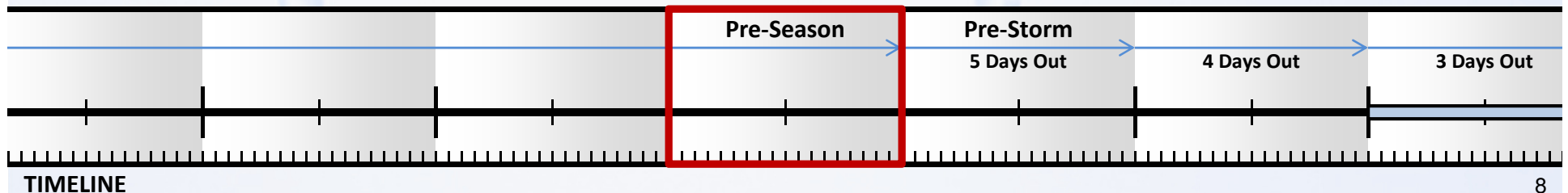
- Route Planning
 - A new "route optimization" initiative will be tested at the Colesville Depot
- New Type of Snow Plow
 - A new heavy snow plow truck with a "wing plow" was added to the fleet
 - Broadens the plow area



Pre-Season

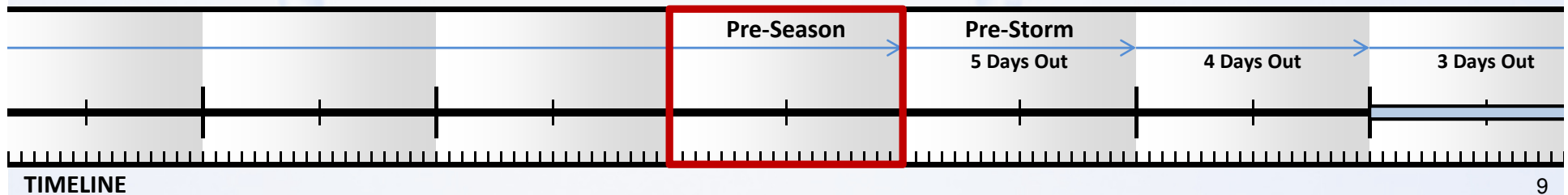
Administrative Readiness

- MOC Storm Day
- Snow Summit
- Updated Snow Book (CD's available)
- Enhanced communications (internally & externally)
- Fleet (restore and maintain all equipment ready to go)
- Contractors (manpower, equipment, materials and services)
- Salt, sand and salt brine stockpiles (restock all anti-icing and deicing materials - currently at capacity)
- Food



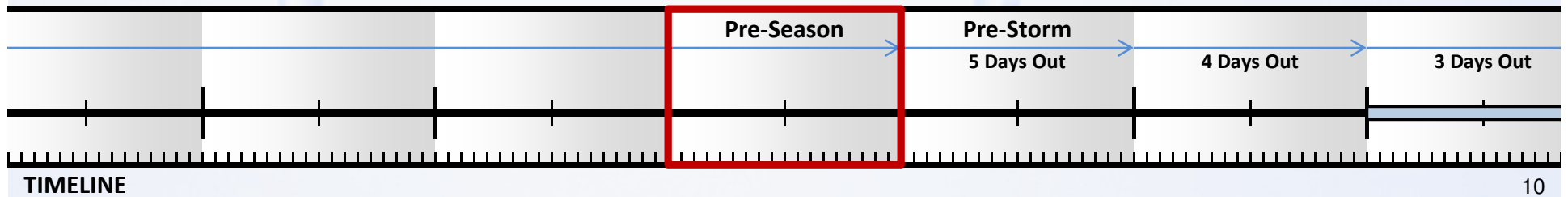
Storm Forward Planning

- What do we plan for? (Planning “Drivers”)
 - Classic exercise in recourse planning/acquisition
 - Key resources – County DOT employees
 - Equipment Operators
 - Supervisors and Managers
 - Contract Support (regional competition)
 - Materials
 - Quick to obtain additional snow removal equipment



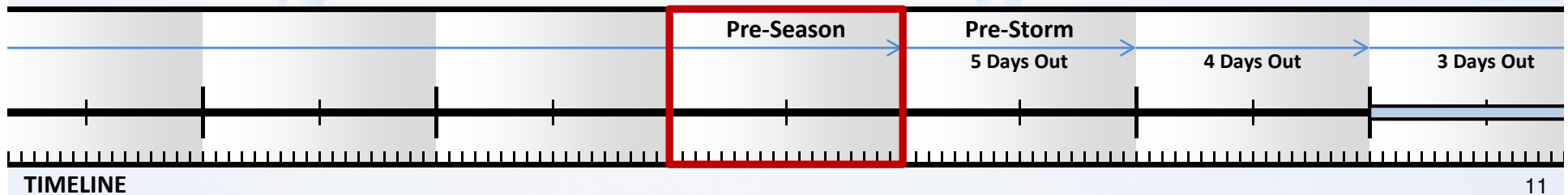
Pre-Season Preparations

- DHS staff and contractors are an experienced and professional workforce
 - Train new Depot employees (Snow Plow Best Practices)
 - Train SOC staff (Web EOC, NIMS 100 & 200)
- Fleet Management experienced and committed partners



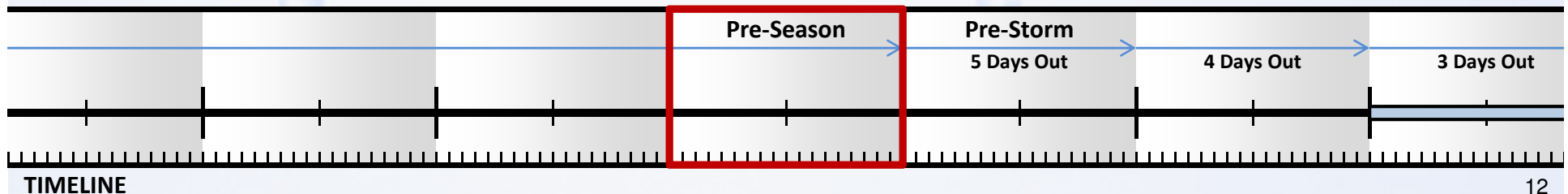
Coordinate Contractors

- Contractor equipment inspections and calibrations are conducted from October 28, 2012 to November 4, 2012
- Provided with updated GIS plow maps and County Inspectors contact information
- Provided with updated TomTom navigation information
- Equipment pay rates were determined according to the equipment presented at the inspection



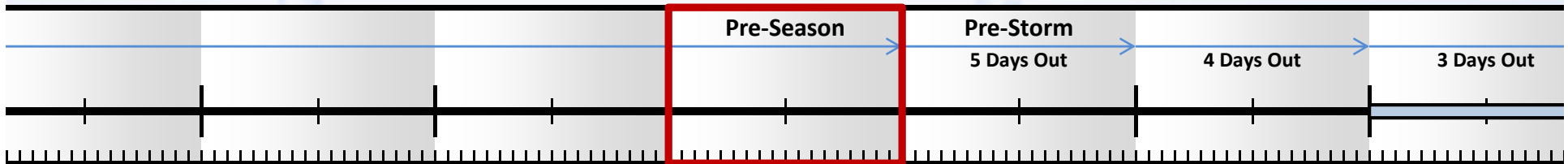
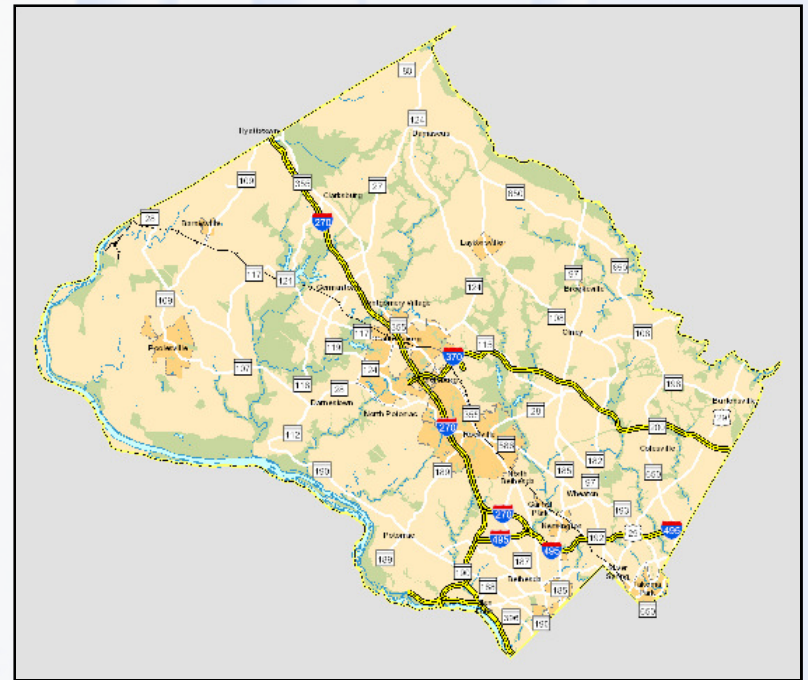
Salt Management Plan

- Adoption of Salt Management Plan
 - Quality operator training
 - Improve record keeping
 - Measure outputs
 - Application rates
 - Mapping of salt vulnerable areas
 - Good house-keeping of salt storage facilities
 - Identification of snow dump sites



Statistics

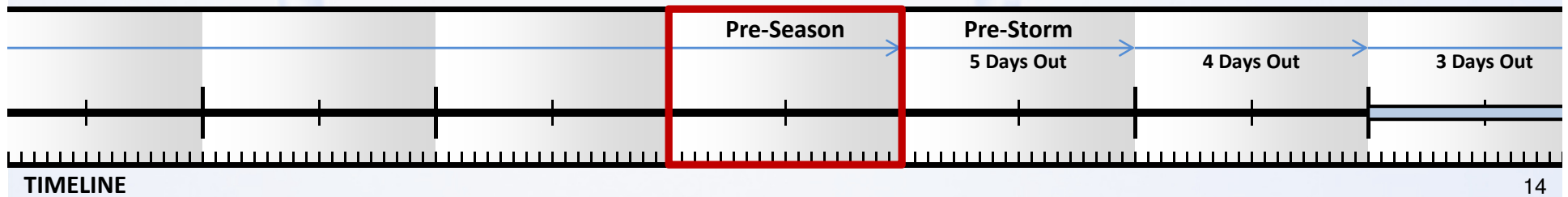
- DOT required to clear approximately 5123 lane miles
- 602 lane miles of Emergency Routes
- 364 lane miles of Salt Routes
- 4157 lane miles of Neighborhood Plow Routes



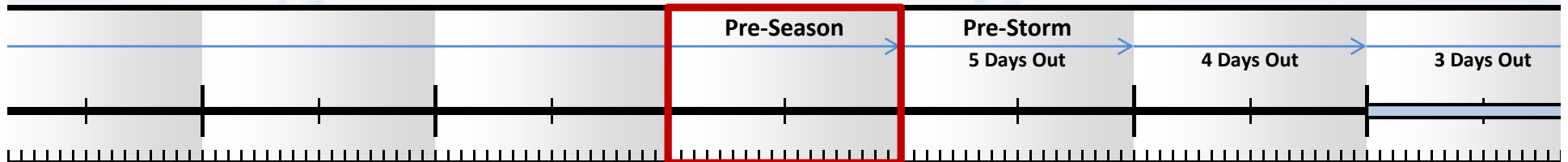
TIMELINE

Statistics

- 989,794 Residents (US Census 2011 estimate)
- 202 Schools
- 4 Urban Areas (Bethesda, Silver Spring, Wheaton, Clarksburg)
- 26,430 Private Nonfarm Business Establishments (US Census 2010 estimate)
- Over 250 biotech companies along the I-270 Technology Corridor Park

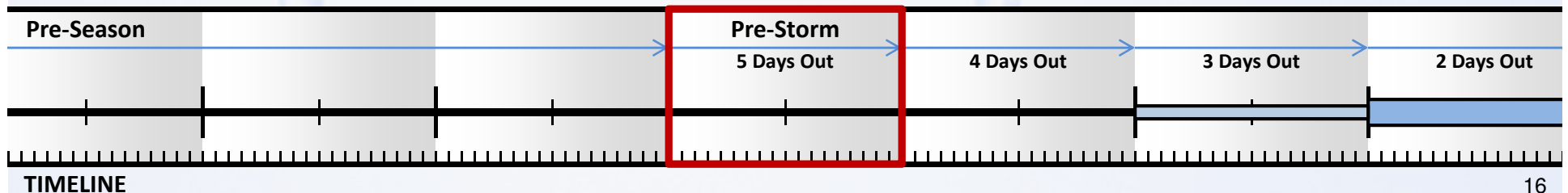


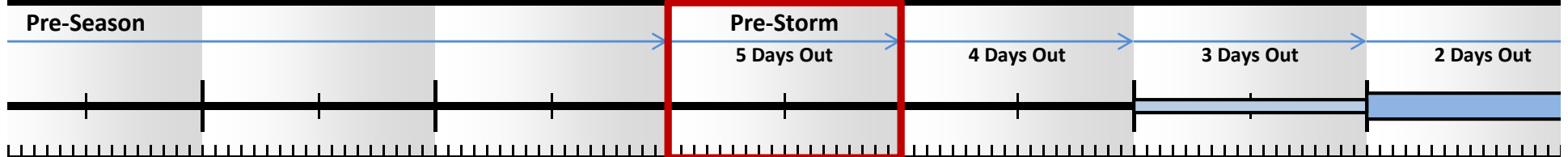
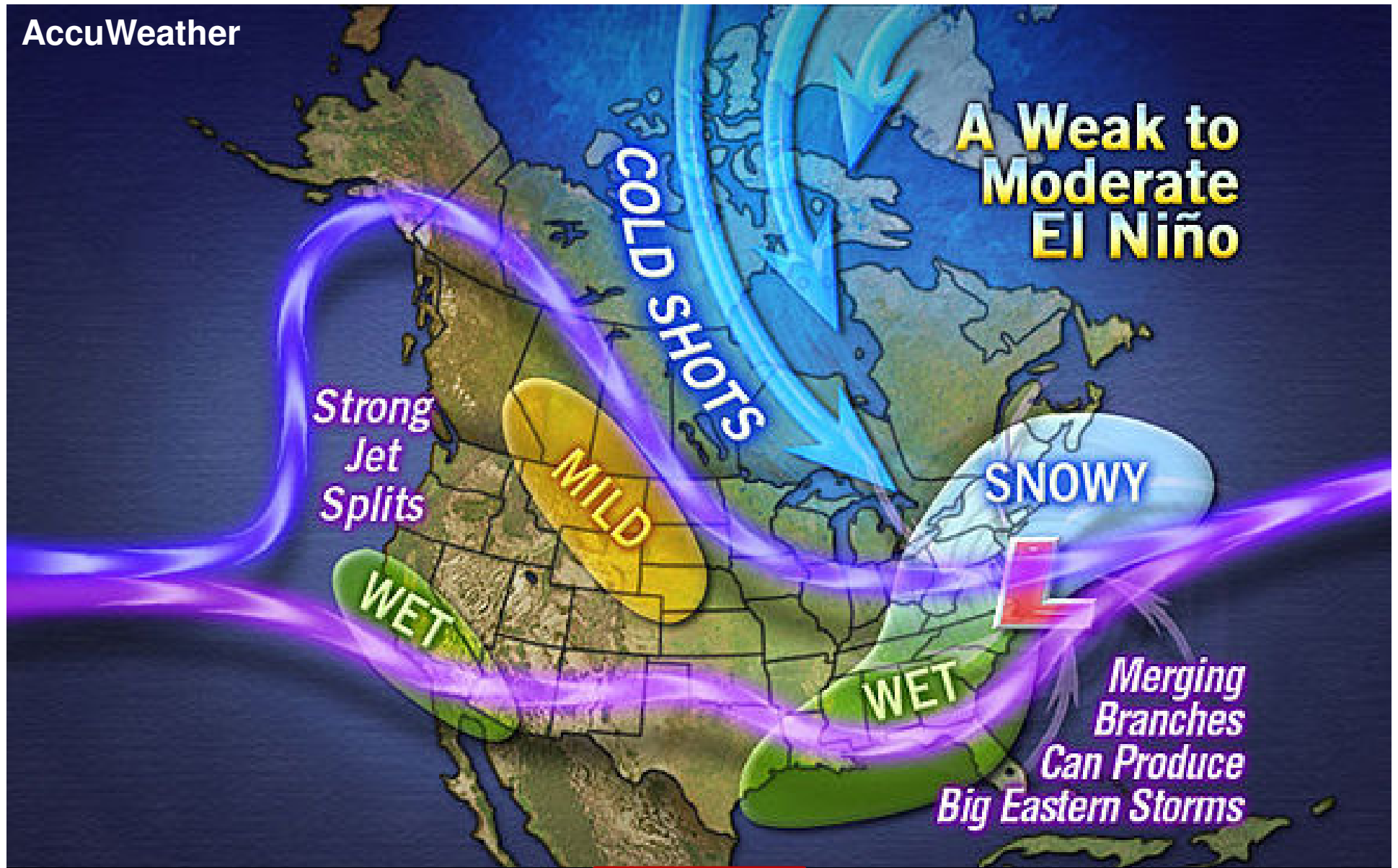
Pre-Storm



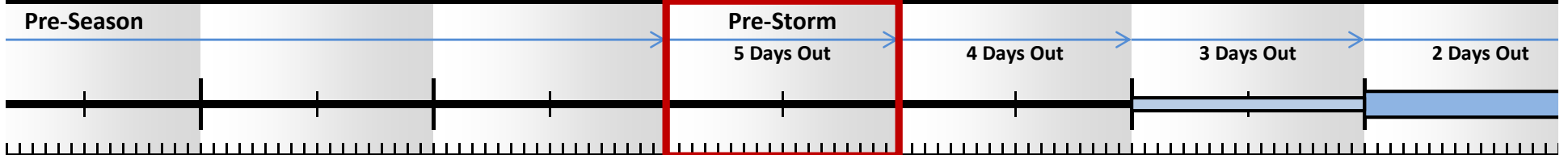
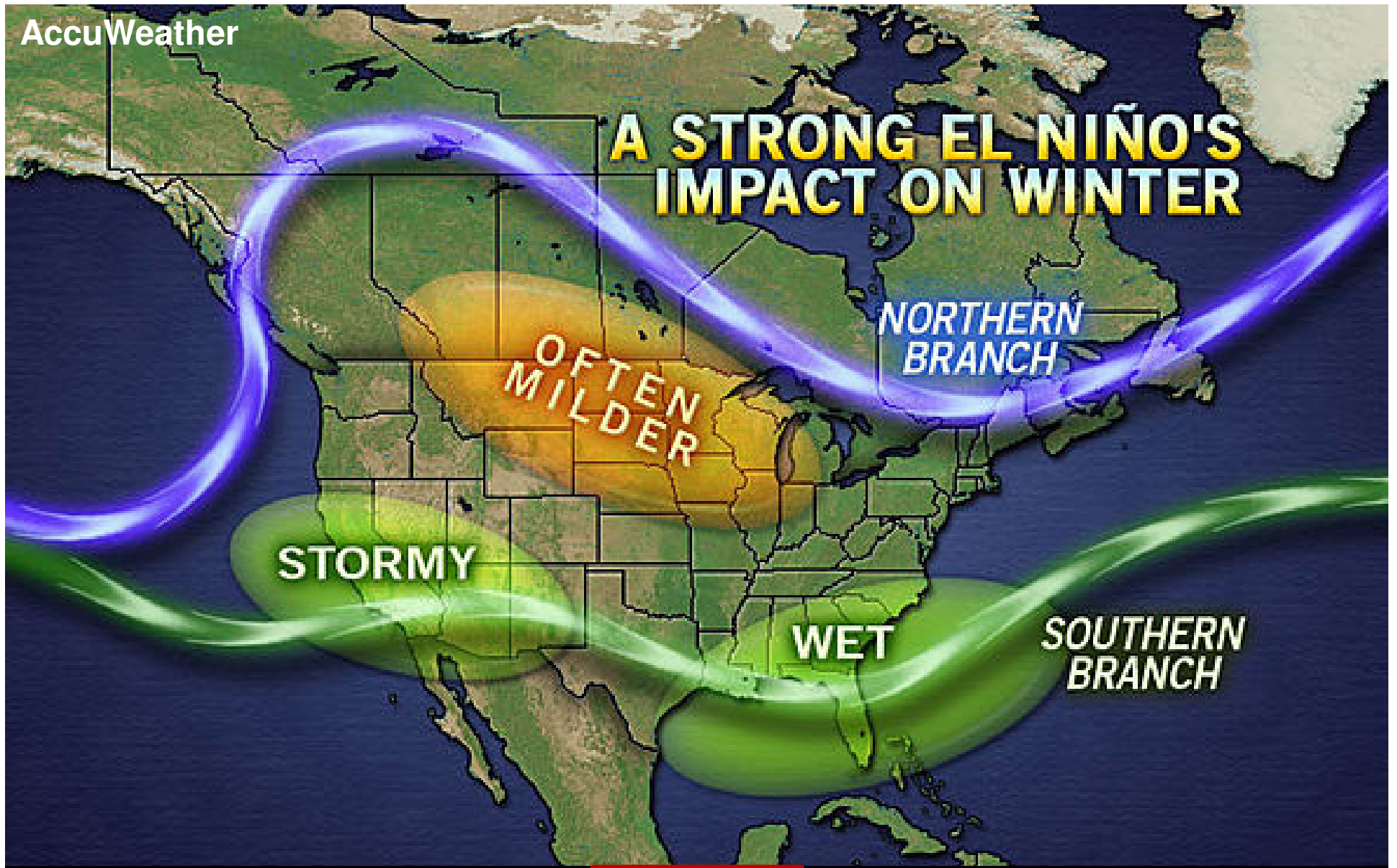
Science of Storm and Pavement Forecasting

- Blends the art and science of snow and ice control
- Leads to a cost-effective, higher level of service for our customers
- Mitigates negative impact of winter operations on the highway system





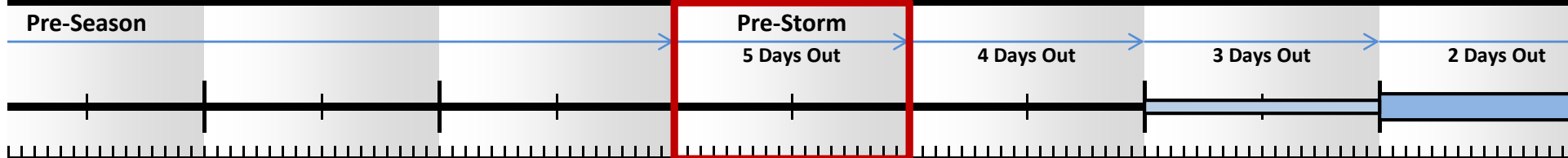
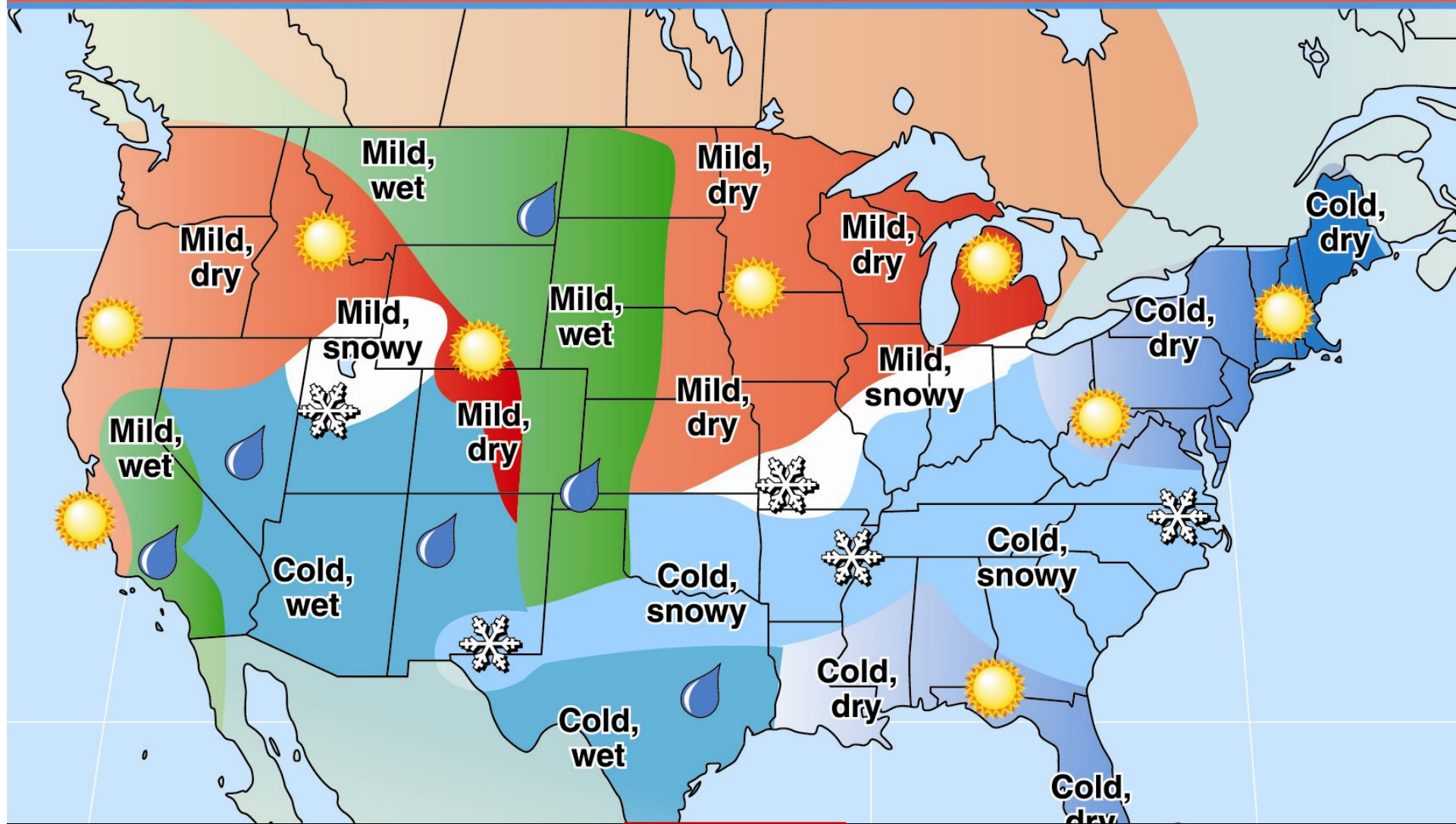
A STRONG EL NIÑO'S IMPACT ON WINTER



WINTER OUTLOOK 2012-2013

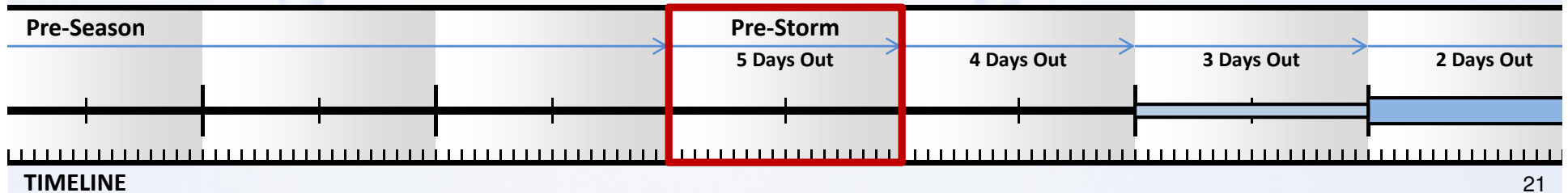


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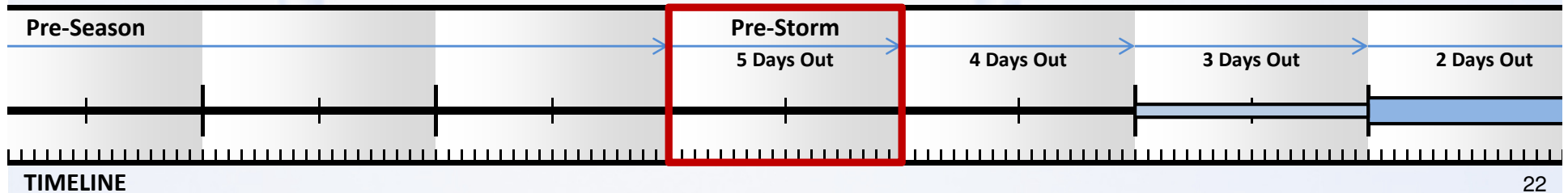
Storm Forecast Planning

- “Woolly” winter prediction
 - The Woolly Bear Caterpillars have predicted that the coming winter is going to be very cold and wet
 - According to legend
 - the wider the middle brown band is (i.e., the more brown segments there are), the milder the coming winter will be
 - a narrow brown band is said to predict a harsh winter



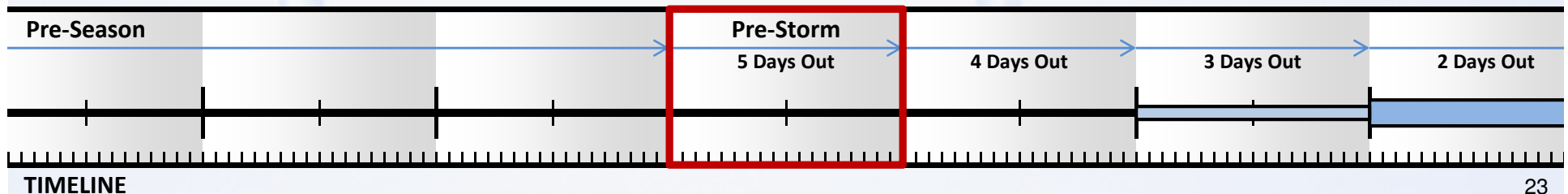
Storm Forecast Planning

- Keep ahead of advancing winter weather by monitoring forecasts.



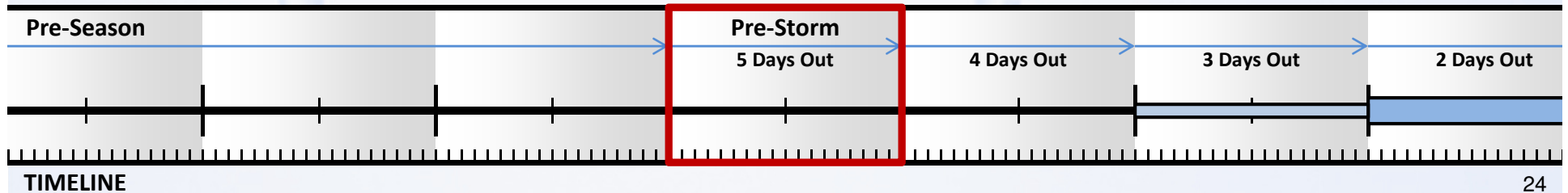
Local Forecasting

- Increased real time “intelligence” using local forecasting capability (satellite and ground monitoring weather stations)
 - Over 300 Earth Networks™ weather stations located in Metro Region
 - Storm response strategy and mobilization decisions based on forecasts, predictions, and real time information
- Conference calls are conducted with meteorologists
- SOC issues daily internal weather forecast at 2:00pm



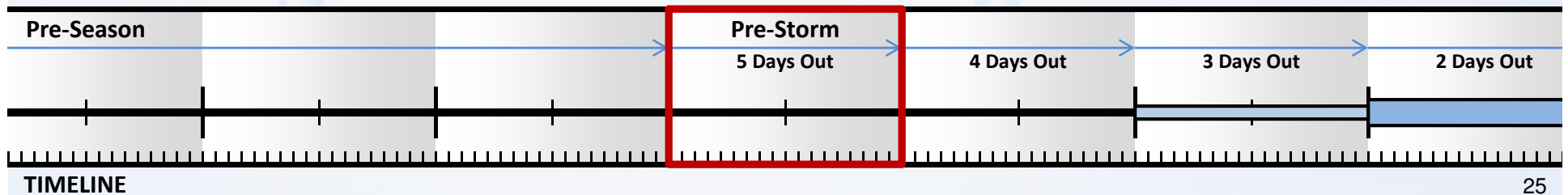
Storm Forecasting Notifications

- Highway Services is notified by
 - Alert Montgomery
 - AccuWeather®
 - National Weather Service
 - Earth Networks™
 - Other sources such as national news



Storm Forecasting Notifications

- Notifications vary from 5-days out to less than 48-hours
 - Winter Weather Advisory
 - Snow Advisory
 - Winter Storm Watch
 - Winter Storm Warning
 - Blizzard Watch
 - Blizzard Warning



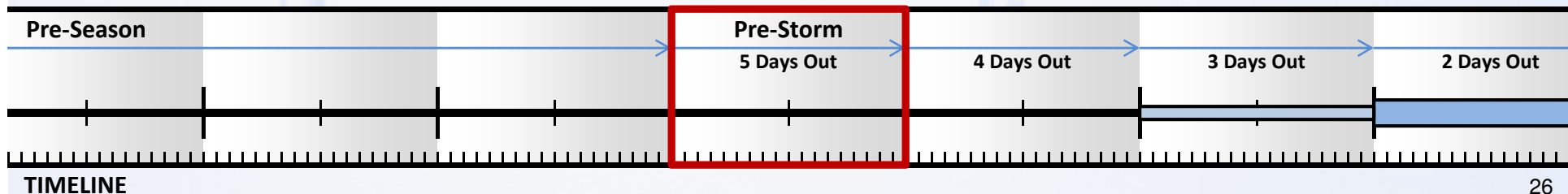
Storm Forecasting Notifications

- National notification from AccuWeather® (2,000 mile view; 3-5-days out)
- AccuWeather® Special Statement (1,000 mile view; 2-3-days out)
- AccuWeather® Alert (500 mile view; 36-48 hours out)
- AccuWeather® Warning (100 mile view; < 36 hours out)
- Earth Networks™ (local “real- time” weather conditions)

<input type="checkbox"/> 1. Storm Alert <input checked="" type="checkbox"/> 2. Storm Warning <input type="checkbox"/> 3. Update to Storm Warning <input type="checkbox"/> 4. See Special Statement <input type="checkbox"/> 5. Previously Issued <input type="checkbox"/> Remains in Effect	ACCUWEATHER® SNOW WARNING SERVICE™ 385 SCIENCE PARK RD., STATE COLLEGE, PA 16803 Joel N. Myers, PhD, President Elliot Abrams, M.S., CCM, Sr. Vice President	If you have questions, call (814) 235-8721
STORM WARNING Exclusively For MONTGOMERY COUNTY MD - DEPT. OF TRANSPORTATION Friday, 19-FEB-2009 Time: 12:18 PM Fostr: GLM		
STORM ALERT A. Chance of a Storm <input type="checkbox"/> 6. Excellent <input type="checkbox"/> 7. Good <input type="checkbox"/> 8. Fair B. Estimated Start Time <input type="checkbox"/> 9. At ____ AM ____ <input type="checkbox"/> 10. At ____ PM ____ <input type="checkbox"/> 11. Any furies before this start time will bring little or no accumulation. C. Storm Type <input type="checkbox"/> 12. Snow ____ inches <input type="checkbox"/> 13. Sleet <input type="checkbox"/> 14. Freezing Rain (Glaze) <input type="checkbox"/> 15. Rain Turning to Snow <input type="checkbox"/> 16. Snow Turning to Rain <input type="checkbox"/> 17. Blowing and Drifting <input type="checkbox"/> 18. Plowing Operation D. Estimated Storm Duration <input type="checkbox"/> 19A. < 6 Hrs. <input type="checkbox"/> 19B. 6-12 Hrs. <input type="checkbox"/> 19C. 12-18 Hrs. <input type="checkbox"/> 19D. > 18 Hrs. E. Additional Comments	H. Storm Will End <input checked="" type="checkbox"/> 40. At 8-7 AM SUN <input type="checkbox"/> 41. At ____ PM ____ <input type="checkbox"/> 42. Timing Excellent <input checked="" type="checkbox"/> 43. Timing Good <input type="checkbox"/> 44. Timing Uncertain I. Snow and Ice Accumulation <input checked="" type="checkbox"/> 45. Snow Total: 6-10 inches <input type="checkbox"/> 46. Ice Total: ____ inches <input type="checkbox"/> 47. Additional Snow Accum. ____" <input type="checkbox"/> 48. Additional Ice Accum. ____" <input type="checkbox"/> 49. ____" by 4 PM Today <input type="checkbox"/> 50. ____" by 8 AM Tomorrow <input type="checkbox"/> 51. Two inches by ____ J. Snow Probability Potential <input type="checkbox"/> 52. ____% Chance of 2" or more <input checked="" type="checkbox"/> 53. 80% Chance of 4" or more <input checked="" type="checkbox"/> 54. 65% Chance of 6" or more <input checked="" type="checkbox"/> 55. 25% Chance of 10" or more <input type="checkbox"/> 56. ____% Chance of ____" or more K. Snow Type <input type="checkbox"/> 57. Very Dry <input checked="" type="checkbox"/> 58. Dry <input type="checkbox"/> 59. Wet <input type="checkbox"/> 60. Melting <input type="checkbox"/> 61. Wet Becoming Dry <input type="checkbox"/> 62. Dry Becoming Wet L. Drifting <input type="checkbox"/> 63. None <input checked="" type="checkbox"/> 64. Light <input type="checkbox"/> 65. Moderate <input type="checkbox"/> 66. Severe <input checked="" type="checkbox"/> 67. Becoming Moderate <input type="checkbox"/> 68. Becoming Severe M. Rain Type <input type="checkbox"/> 69. Severe Freeze (Below 25°) <input type="checkbox"/> 70. Freeze (20°-35°) <input type="checkbox"/> 71. Cold (32°-35°) <input type="checkbox"/> 72. Warm (Above 35°) <input type="checkbox"/> 73. Becoming Warm N. Freezing Rain Will Begin <input type="checkbox"/> 74. At ____ AM ____ <input type="checkbox"/> 75. At ____ PM ____ <input type="checkbox"/> 76. Timing Excellent <input type="checkbox"/> 77. Timing Good <input type="checkbox"/> 78. Timing Uncertain O. Effect of Rain <input type="checkbox"/> 79. Turn Snow to Slush <input type="checkbox"/> 80. Wash Snow Away Slowly <input type="checkbox"/> 81. Wash Snow Away Quickly <input type="checkbox"/> 82. Make Roads Icy <input type="checkbox"/> 83. Icing On Trees/Power Lines <input type="checkbox"/> 84. Localized Flooding	P. Temperatures and Winds <input checked="" type="checkbox"/> 85. Saturday <input type="checkbox"/> 86. Sunday <input type="checkbox"/> 87. Main Roads Snow Covered <input checked="" type="checkbox"/> 88. Main Roads Slushy AT FIRST <input type="checkbox"/> 89. Main Roads Icy <input type="checkbox"/> 90. Main Roads Icy in Spots <input type="checkbox"/> 91. Main Roads Wet <input checked="" type="checkbox"/> 92. Secondary Roads Snow Covered <input type="checkbox"/> 93. Secondary Roads Slushy <input type="checkbox"/> 94. Secondary Roads Icy <input type="checkbox"/> 95. Secondary Roads Icy in Spots <input type="checkbox"/> 96. Secondary Roads Wet Q. Temperatures and Winds <input type="checkbox"/> 97. Wet Roads May Freeze <input type="checkbox"/> 98. Slush Will Freeze <input type="checkbox"/> 99. Rapid Change to Colder <input type="checkbox"/> 100. Icing on Bridges <input type="checkbox"/> 101. Icing at Intersections <input type="checkbox"/> 102. Heavy Snow will Begin <input type="checkbox"/> 103. Heavy Snow will End R. Untreated Road Conditions <input type="checkbox"/> 104. Fumes - Insignificant <input type="checkbox"/> 105. Fumes - Little or No Accum. <input type="checkbox"/> 106. Snow/Fumes - Start to Follow <input type="checkbox"/> 107. Freezing Drizzle <input type="checkbox"/> 108. Hard Freeze <input type="checkbox"/> 109. Rapid Freezepup After 4 PM <input type="checkbox"/> 110. Prolonged Melting <input type="checkbox"/> 111. Thaw Tonight <input type="checkbox"/> 112. Thaw Tomorrow <input type="checkbox"/> 113. Thaw <input type="checkbox"/> 114. Thaw Today/Freezepup Tonight <input type="checkbox"/> 115. Days and Nights Below 32° <input checked="" type="checkbox"/> 116. Days Above 32°/Nights Below 32° <input checked="" type="checkbox"/> 117. Very Windy <input checked="" type="checkbox"/> 118. Drifting to Continue <input type="checkbox"/> 119. Next Storm Possible S. Special Problems <input type="checkbox"/> 120. Heavy Snow will Begin <input type="checkbox"/> 121. Heavy Snow will End T. Weather Following Storm <input type="checkbox"/> 122. Heavy Snow will Begin <input type="checkbox"/> 123. Heavy Snow will End U. Additional Comments

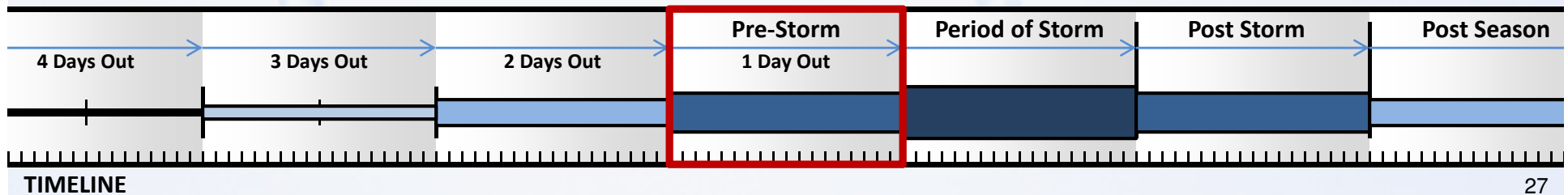
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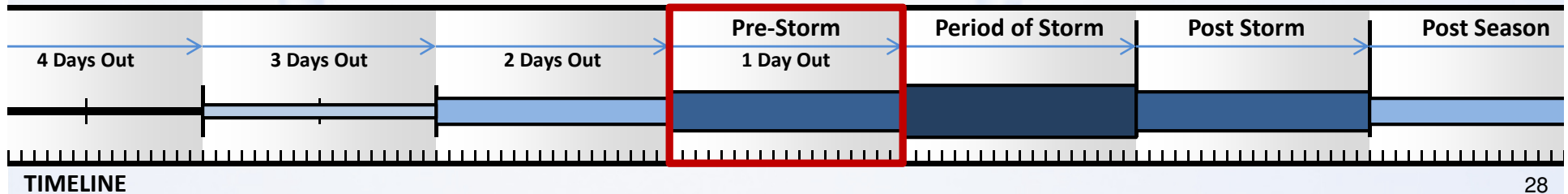
Different Storm Event Scenarios

- Work Day (M-F) Winter Storm Event
- Multiple Winter Storm Events (back-to-back storms)
- Emergency Callback
- After Hours or Weekend Winter Storm Event
- Ice Storm
- Black Ice
- Blizzardddddd!!!!!!!!!!!!!!!!!!!!



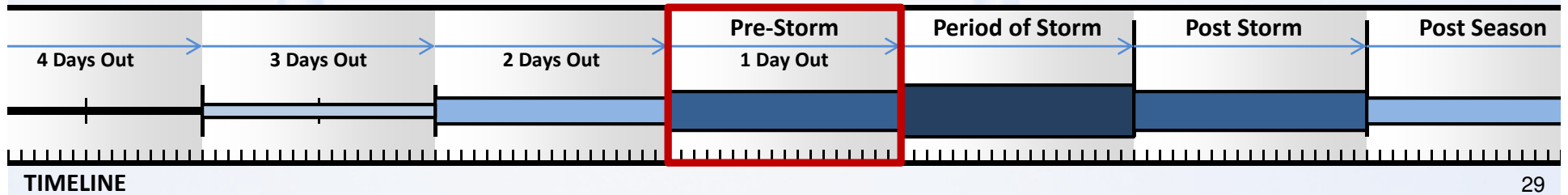
Forecast Considerations

- Pavement forecast considerations
 - Weather forecast (type of precipitation)
 - Air temperature
 - Dew point
 - Pavement temperature
 - Moisture
 - Wind speed and direction
 - Timing of next storm event (back-to-back storms)



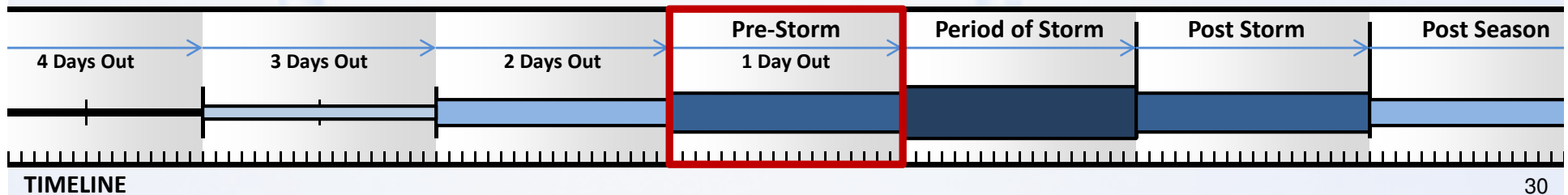
Storm Forecast

- DOT needs to know from Forecasting
 - What's next? (What can we expect?)
 - When will it begin?
 - How long will it last?



Pre-Storm Planning

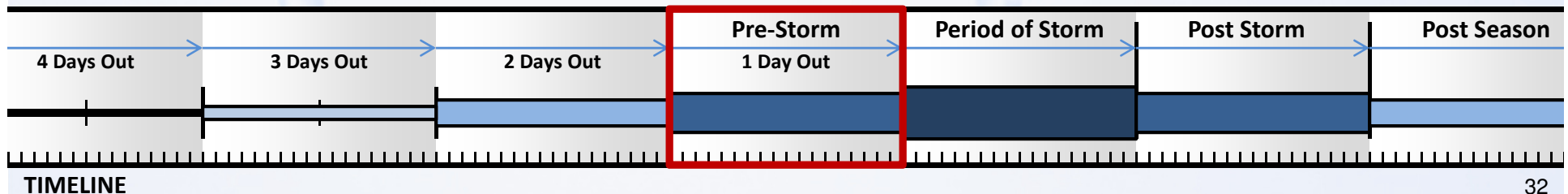
- DOT needs to know our Resources
 - Contractors/Equipment?
 - Availability of snow removal equipment
 - In-house Equipment readiness?
 - Salt/Sand?
 - Inventory/Availability
 - Delivery from Baltimore Harbor



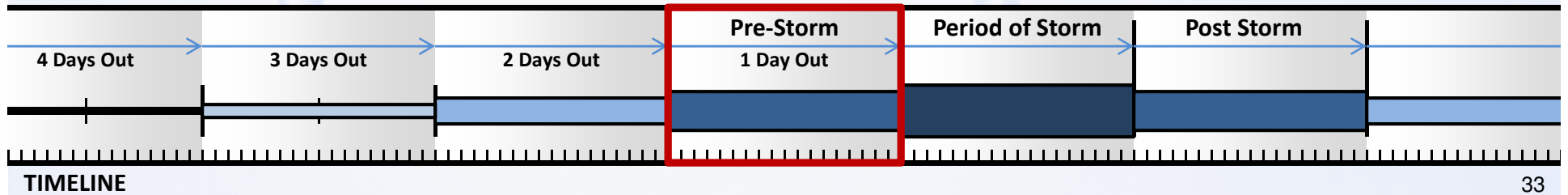


Pretreatment of Major Roadways

- Includes all major roads (966 Lane Miles)
- Brine manufactured in house
 - Assures sufficient quantities to meet needs
- Apply liquid anti-icer to roadway surface before storms
- Cost effective treatment of pavement frost, black ice and snow removal
- Reduces amount of salt applied
- Introduces a significant safety factor
- Easy and environmental friendly



Storm Operations Center (SOC)

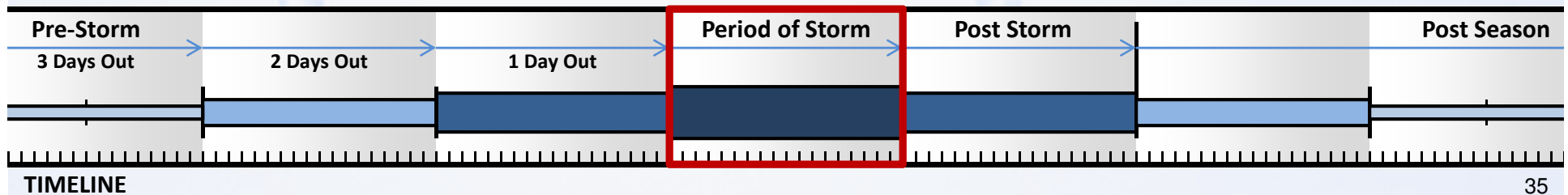




Storm Operations Center (SOC)


Primary Functionality

- Glean intelligence about the scope and magnitude of the event
- Develop a coordinated response to the event
- Management of human, equipment and contractual resources
- Interface with EOC
- Manage road closure database
- Verify and validate field information
- Generate reports of current conditions



- Evaluate field report using Snow Tracking Application
 - Communication between Depots and SOC
 - Track Progress
 - Resource Leveling

MONTGOMERY COUNTY Maryland
montgomerycountymd.gov



Home | Help | Map

RESIDENTS	GOVERNMENT	BUSINESSES	CITY OF GEORGETOWN
------------------	-------------------	-------------------	---------------------------

How Do I...?

Highway Maintenance
[Help | Road Maintenance / Snow Removal / Leaf Collection / Trees / Cuts/Sidewalks](#) > [Department home](#)


Winter Storm Information

Operations Status Information

[Storm Info Home](#) | [FAQ](#) | [Feedback](#)

EngageMD
 Your Government Online

RIDE ON
 www.montgomerymd.gov



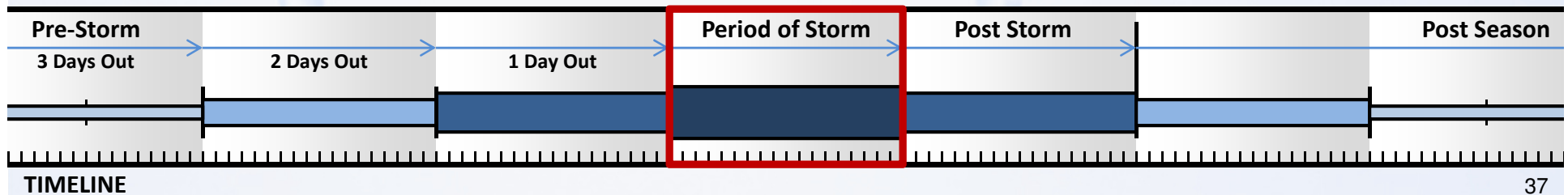
Residents can enter addresses to get plowing information.



Storm Operations Center (SOC)

Support Functions

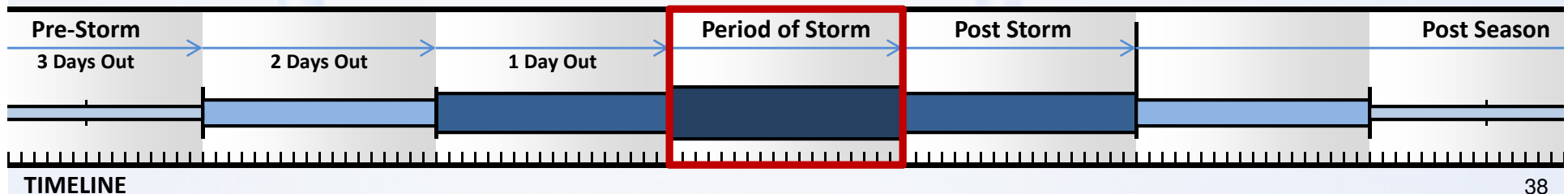
- Storm Operations Manager coordinates information with other entities
 - National level
 - National Incident Management System (NIMS)
 - State level
 - Maryland Emergency Management Agency (MEMA)
 - Maryland State Highway Administration (SHA)



Storm Operations Center (SOC)

Support Functions

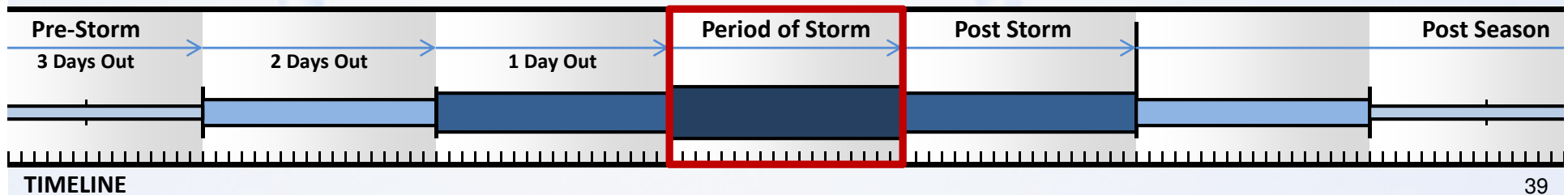
- Storm Operations Manager coordinates information with other entities
 - Local level
 - Emergency Operations Center (EOC) - Interface with WebEOC
 - Utilities (PEPCO, etc.)
 - Emergency Management Group (EMG)
 - Council of Governments (COG)
 - Montgomery County Homeland Security
 - Montgomery County 311
 - Transit Services
 - Montgomery County Police Department (MCPD)
 - Montgomery County Fire & Rescue Service (MCFRS)

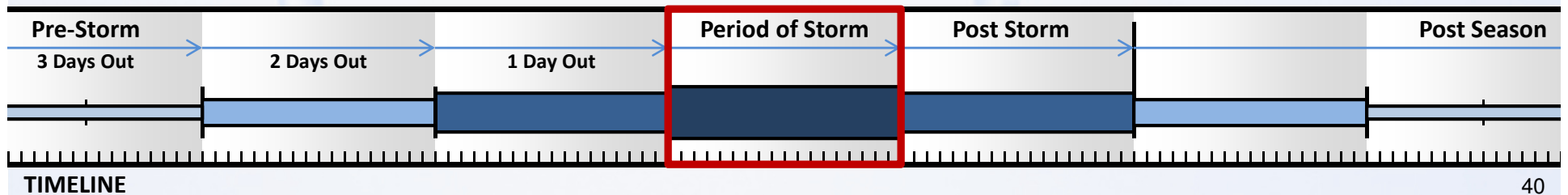
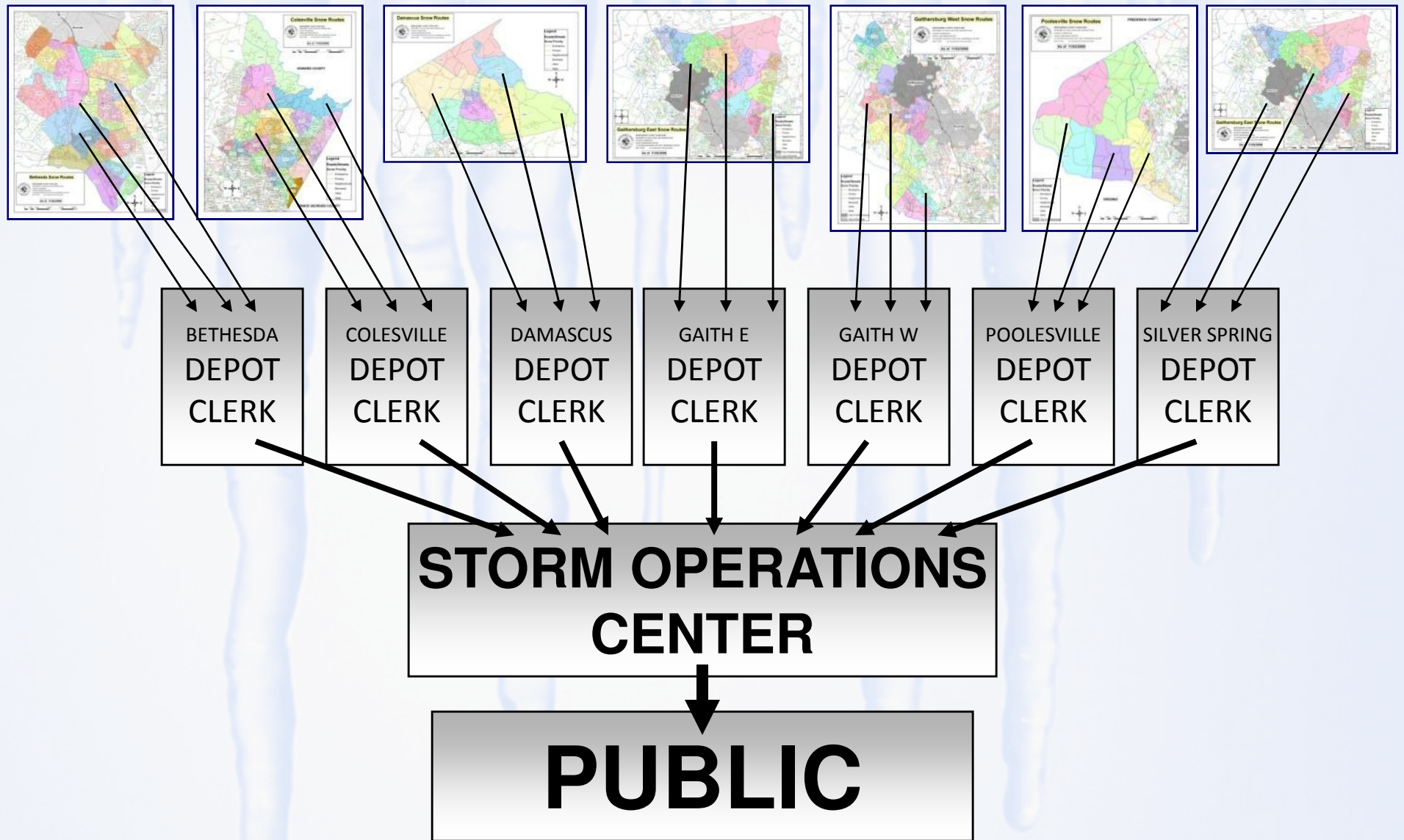


Storm Operations Center (SOC)

Support Functions

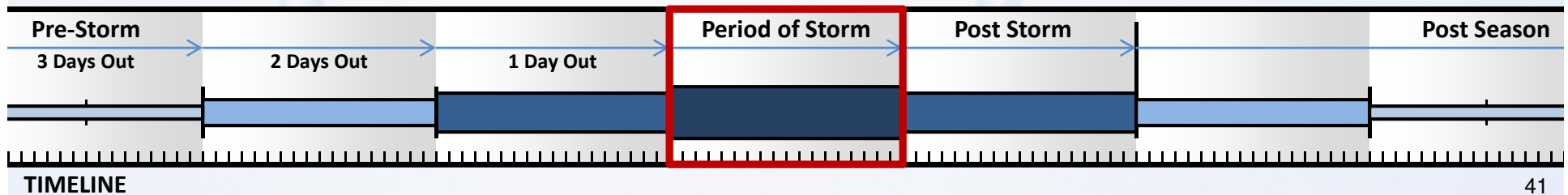
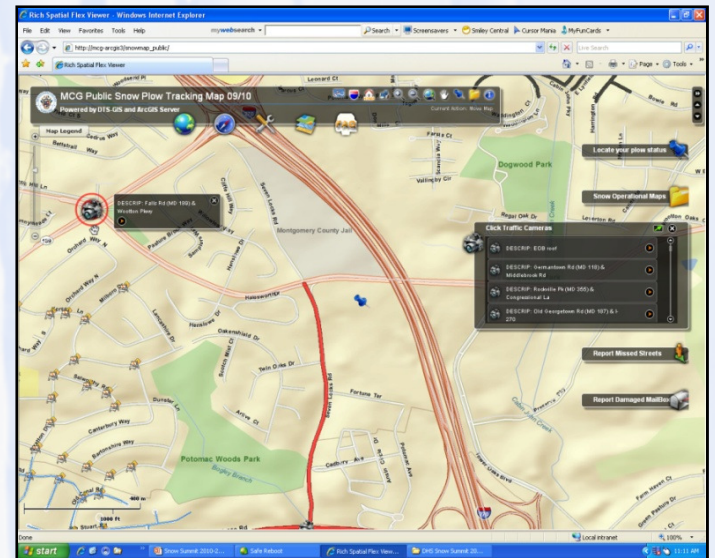
- GIS locations of schools, hospitals, fire stations, metro stations, bus stops, etc.
- Observing real-time weather and pavement conditions
 - 192 Cameras
- Division Chief and Managers confer on operations
- Directives issued to the field
- Interface with public, website, multi-media, interviews, customer service center and snow applications map





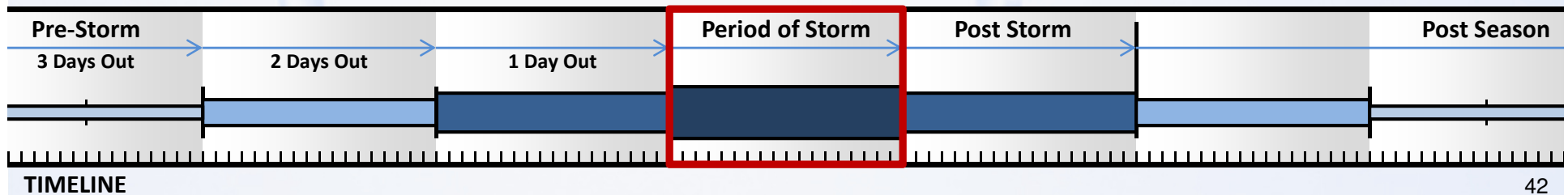
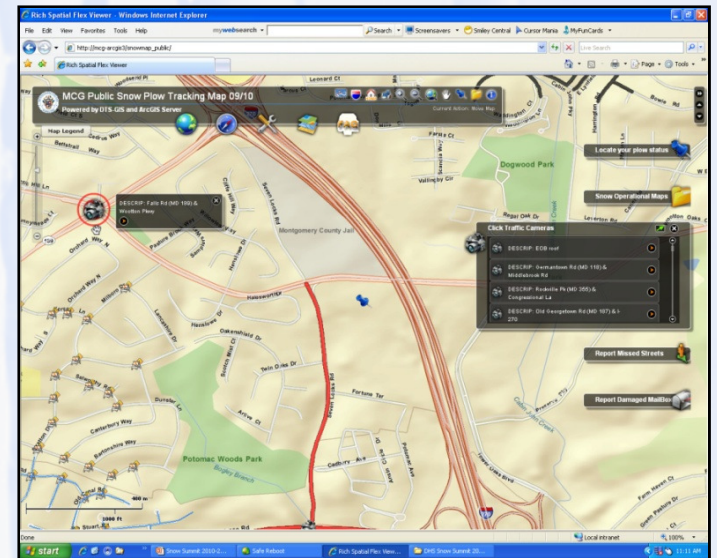
Snow Tracking Application

- Public Snow Plow Tracking Map
 - Leading-edge Technology
 - Keep residents informed
 - Storm operation progress
 - When is it safe to leave my house?
 - How do I plan a trip to a destination?
 - What mode of transportation should I use?



Snow Tracking Application

- Public Snow Plow Tracking Map
 - Robust Functionality
 - Flexible Address Search – “Google Like”
 - Plowing Progress
 - Emergency Roads
 - Traffic Camera Layer
 - Metro & Bus Stop Layer
 - Hospital & School Locations
 - Fire Hydrant Locations
 - Link to Maryland State Highway Road Conditions





Map Legend

Street Intersection Closed



Street/Lane Closed

Non-County Maintained Roads

Emergency Roads

Not Started

In Progress

Complete

Primary Neighborhood Roads

Not Started

In Progress

Complete

Neighborhood Roads

Not Started

In Progress

Complete



Find My House

Street:

Locate

Clear

Street Address Required: e.g: 123 Main St

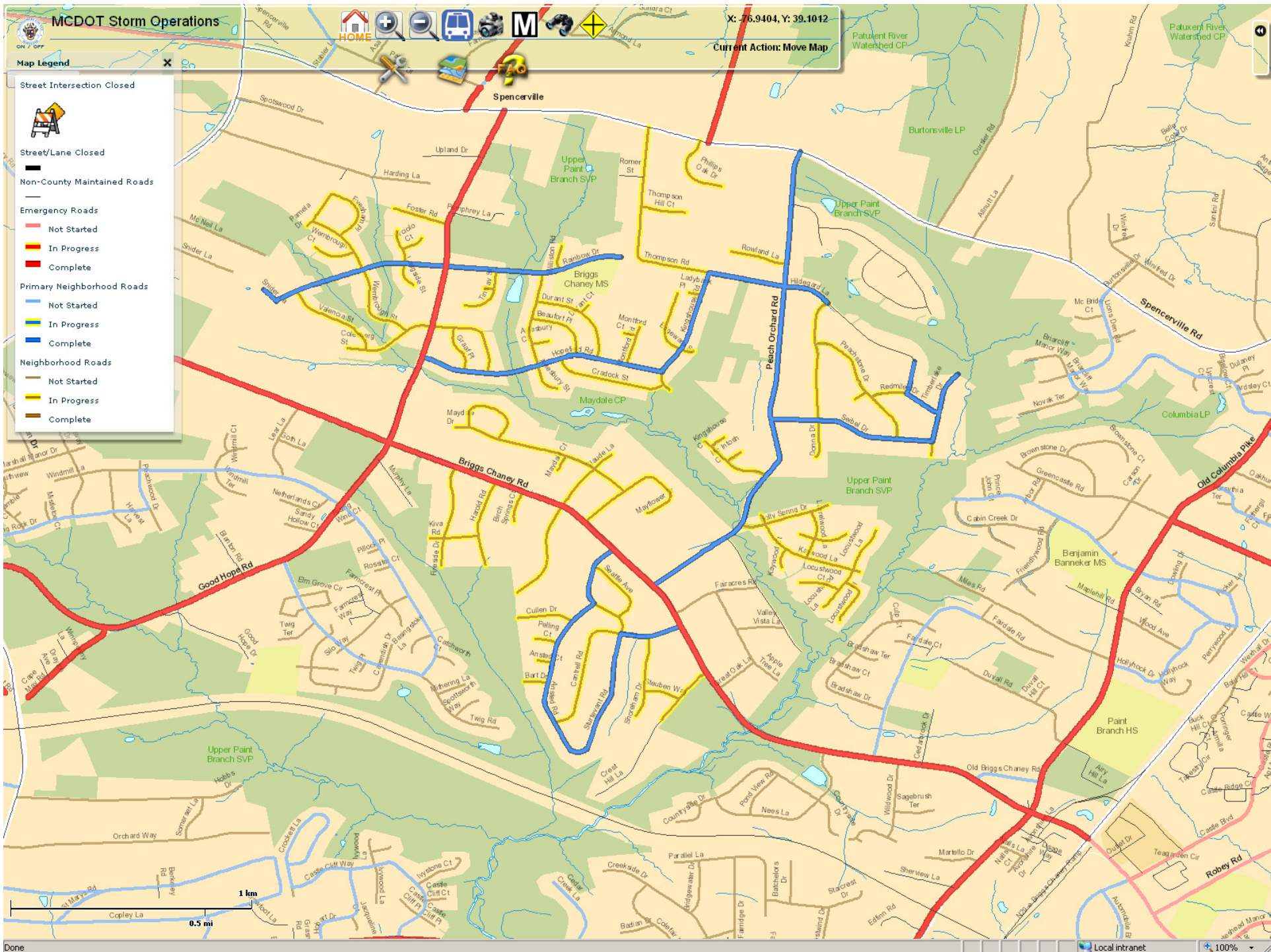
Locate Intersections

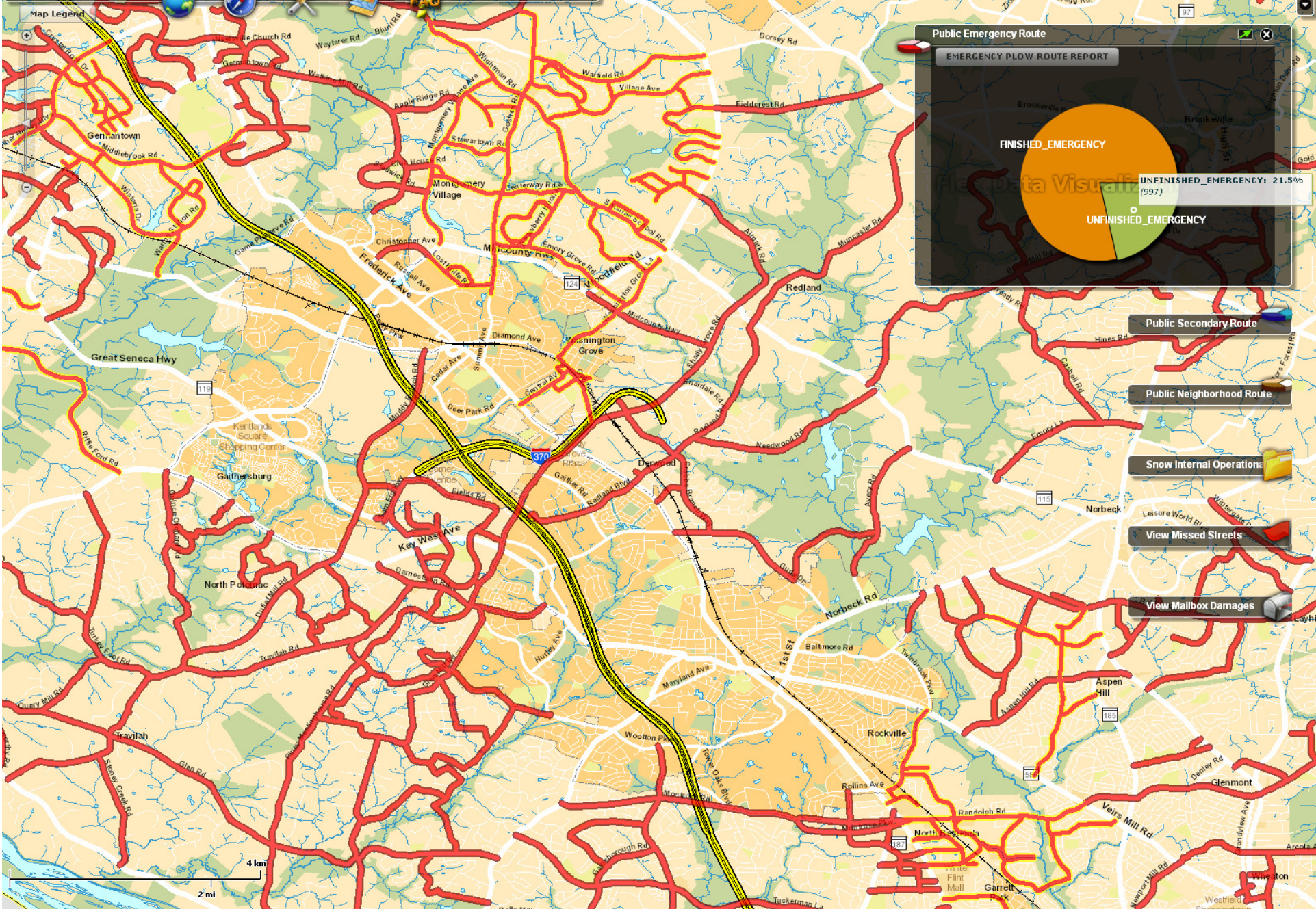
Report Missed Streets

Report Damaged Mail

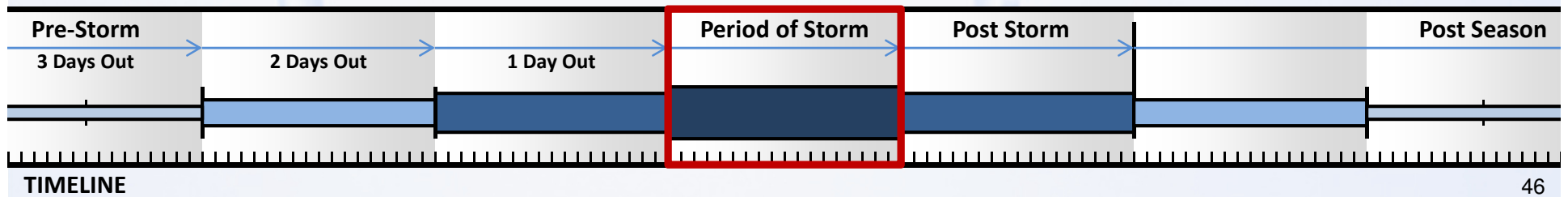
10 km

10 mi



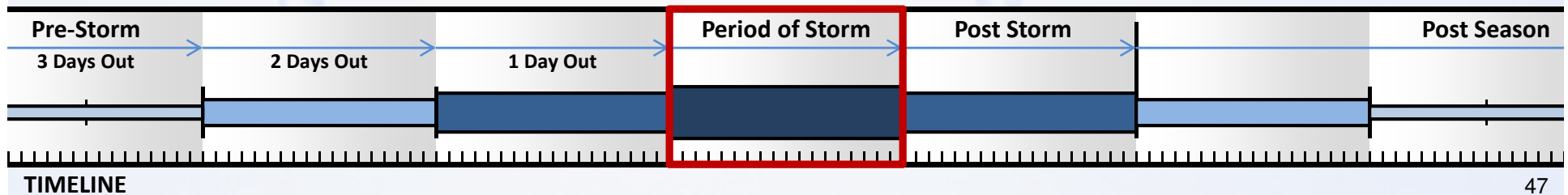


Deployment



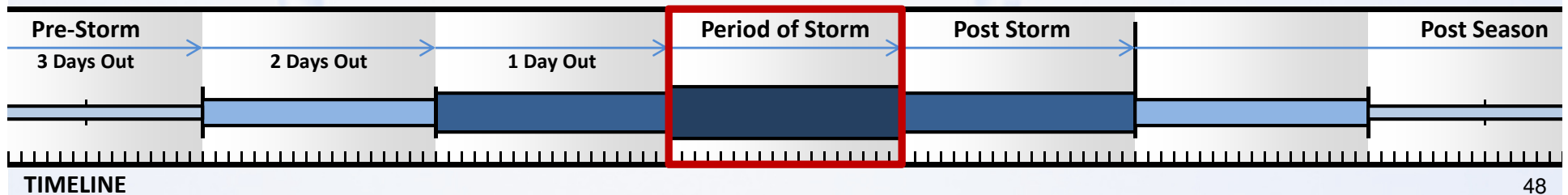
Resources

- 200-225 Personnel
- 175 pieces of equipment
- Contractor Resources to Supplement County
 - 180 contract personnel
 - 200-225 pieces of plowing/sanding equipment
 - If needed additional large pieces with operators
- Resource allocation based on actual “real time” conditions
 - Increased effectiveness and efficiencies



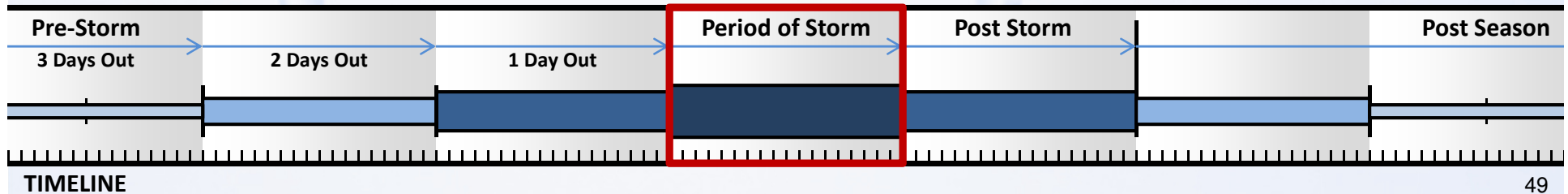
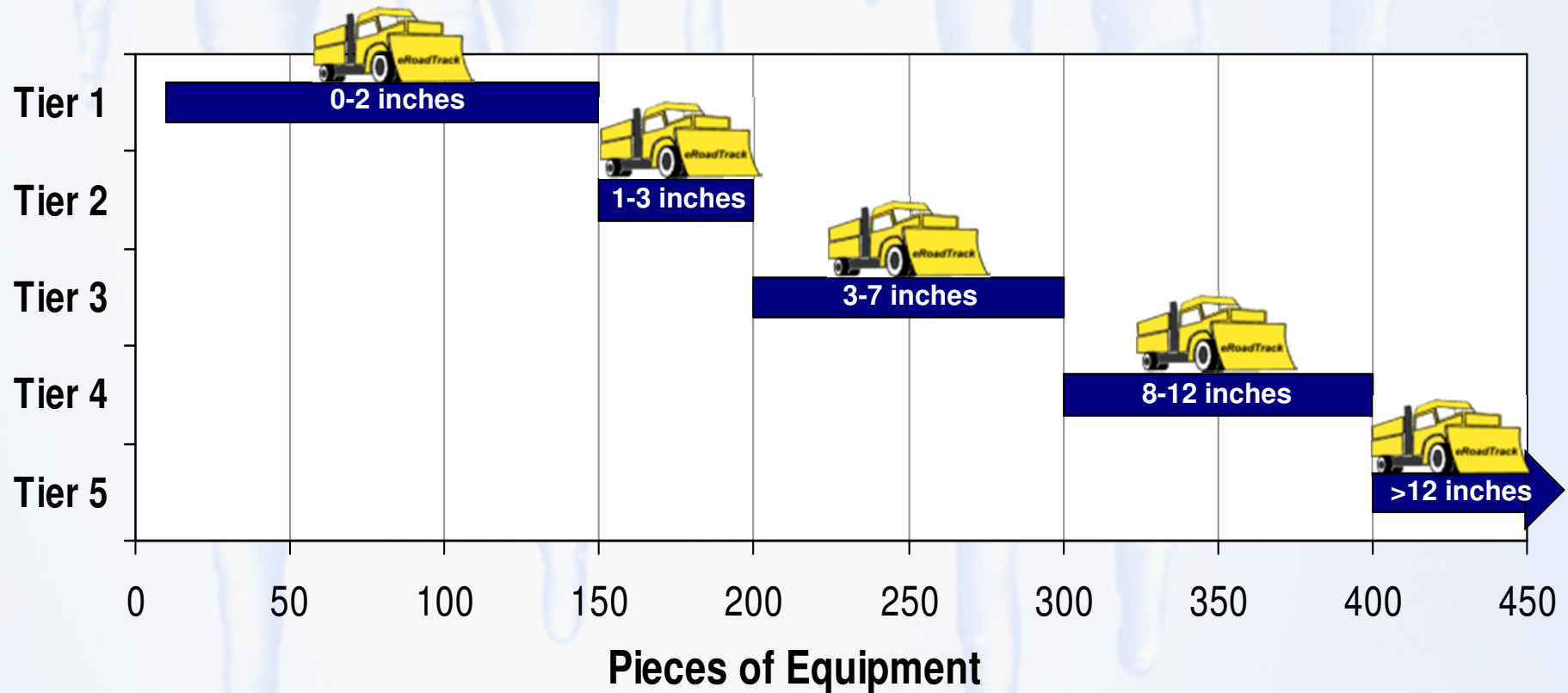
Resources

- Emergency Strike Teams
 - Addresses emergency access issues of unknown certainty
 - Involves key emergency agencies
 - DOT with dump truck and chain saws
 - MCFRS with requisite apparatus (fire trucks, ambulance, etc.)
 - MCPD to provide for safe haven
 - PEPCO to address live power lines
 - All entities share single band radio frequency



Plow Route Efficiencies

- 5 Tier Resource Deployment

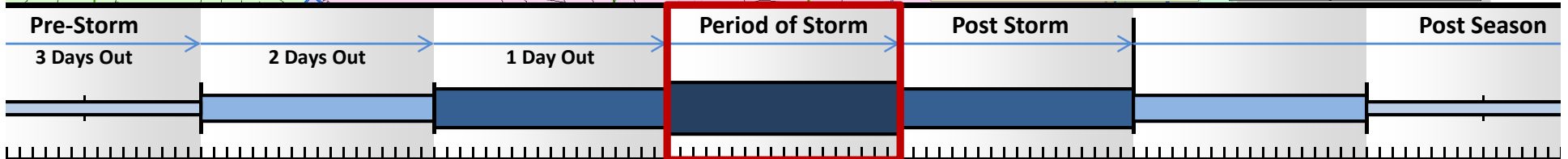
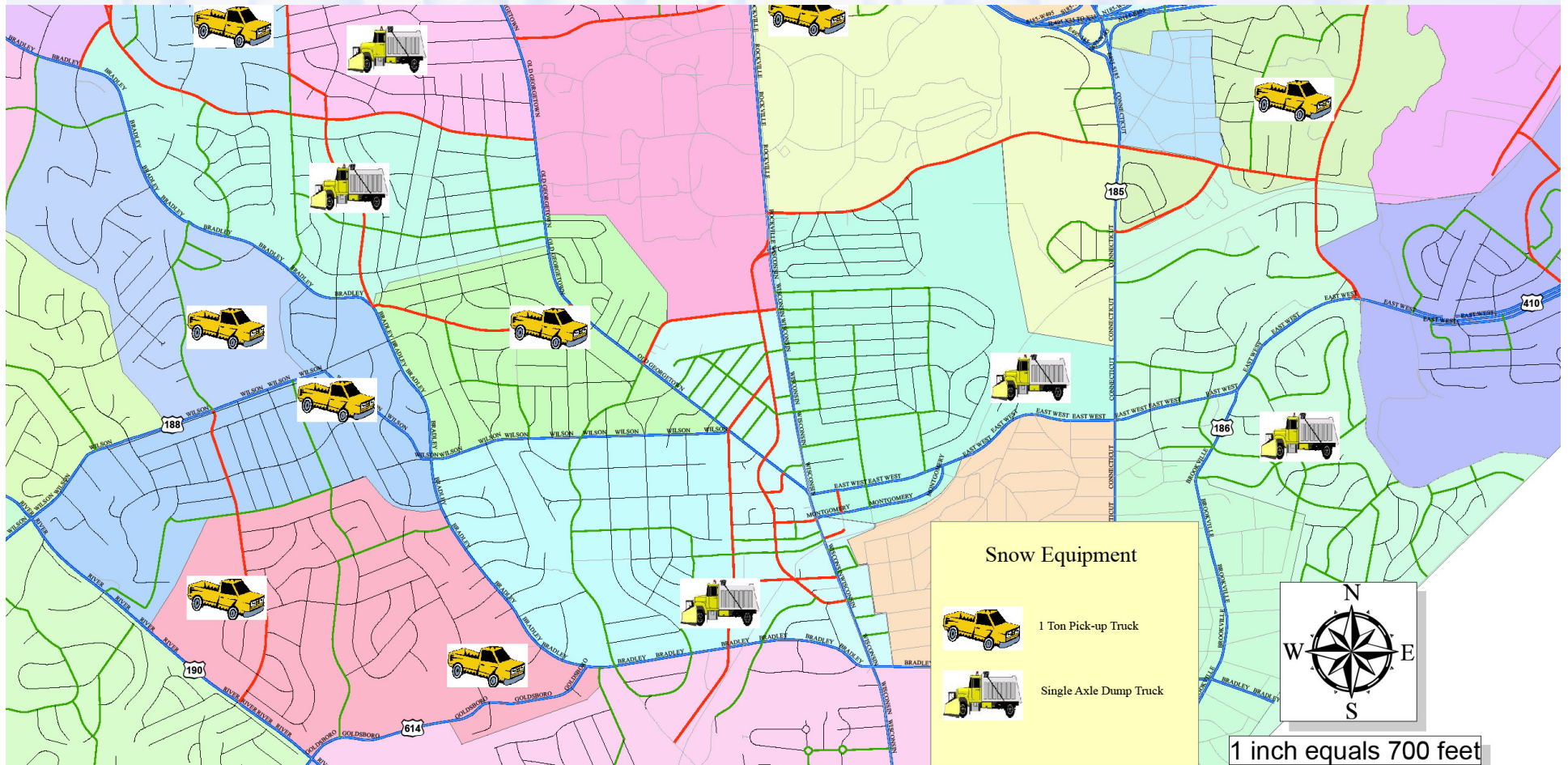


Residential Plow Route

- Intersections (86)
- Cul-de-sacs (7)

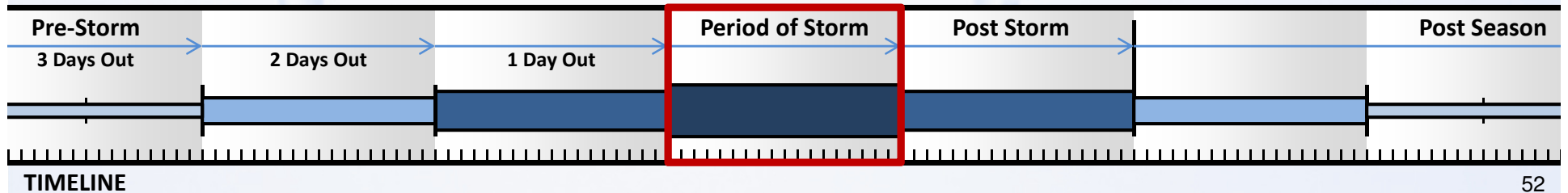
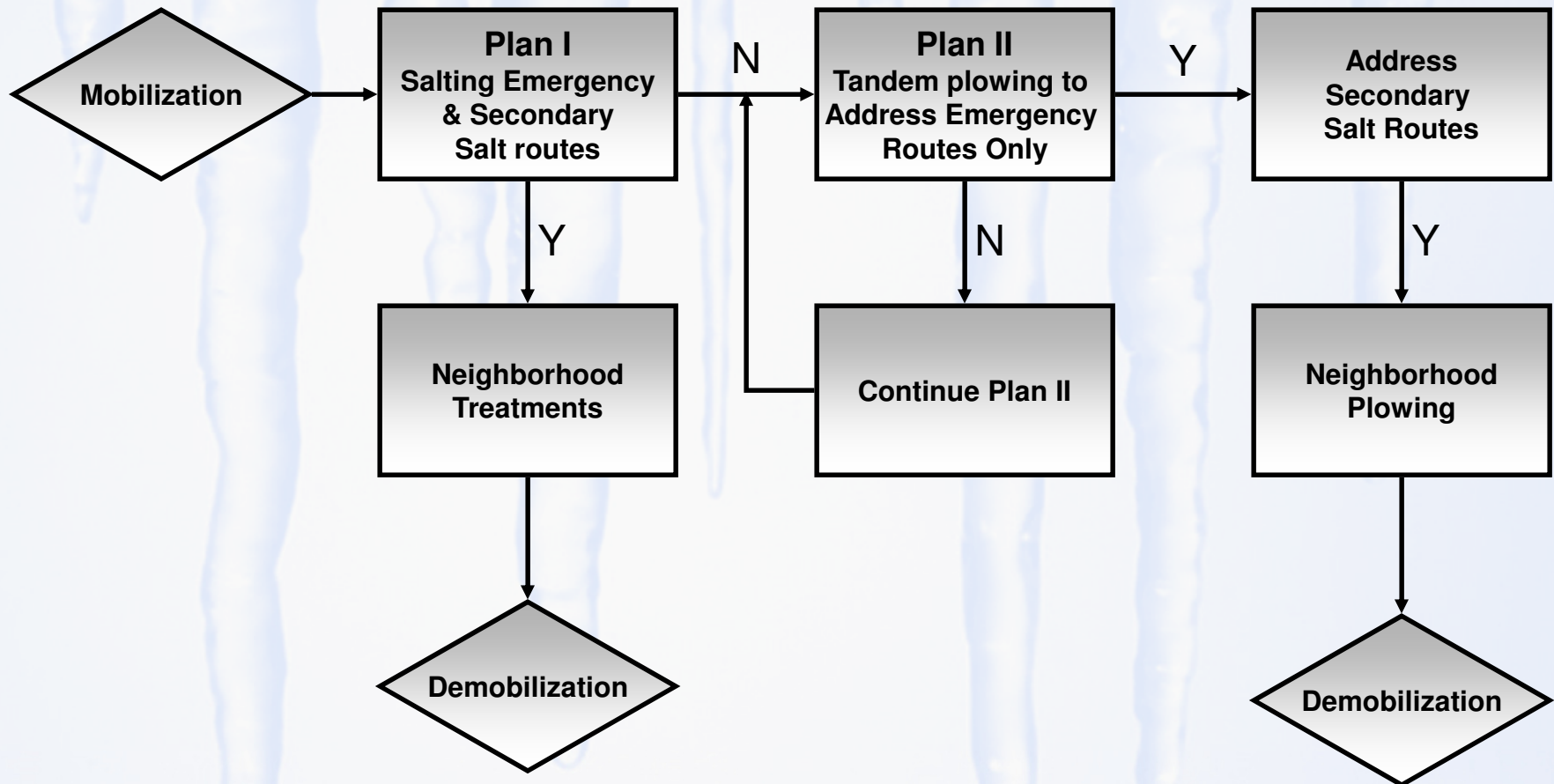
Key Initiatives (cont'd)

Plow Route Efficiencies

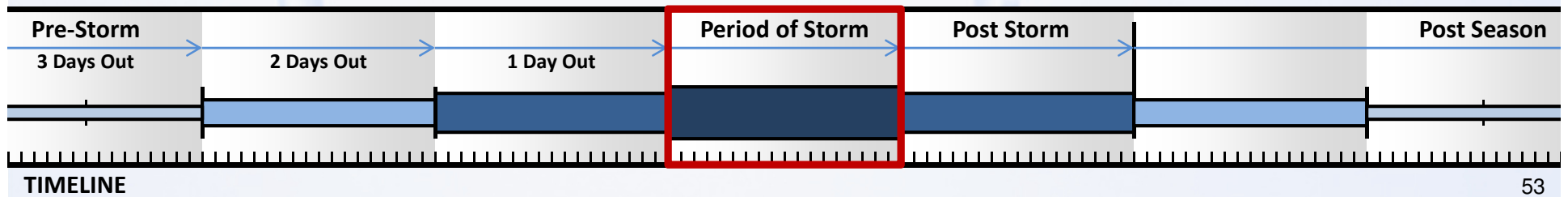


TIMELINE

Storm Operations

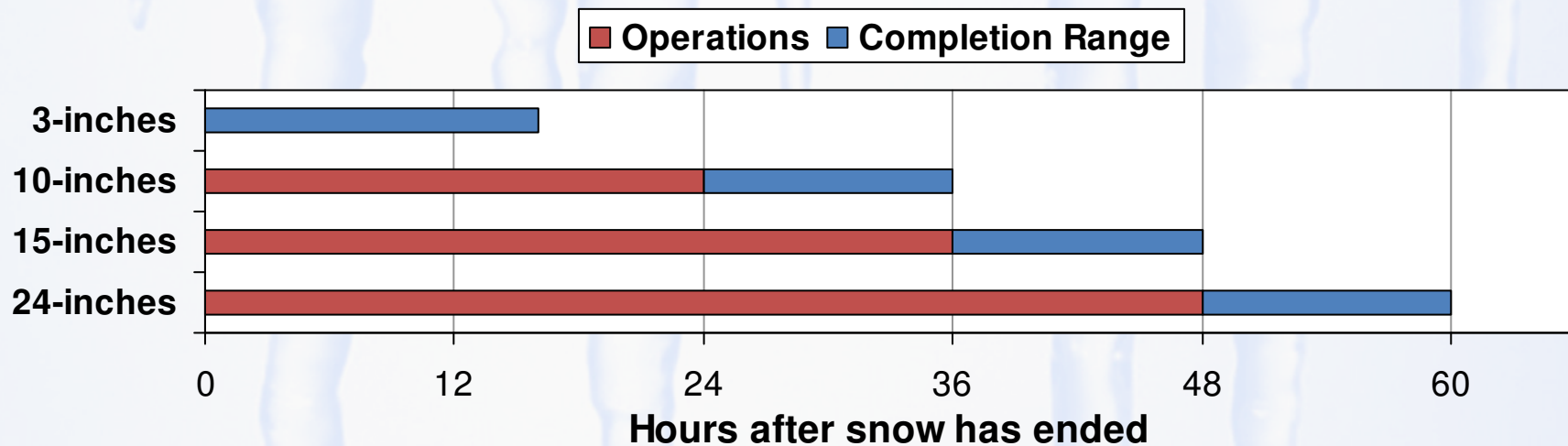


Storm Clean Up

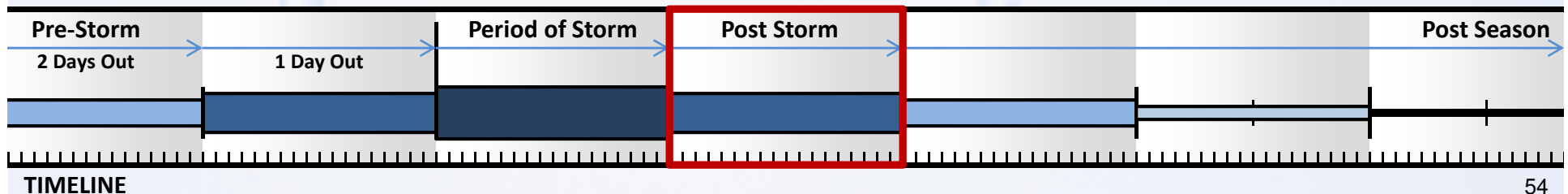


Approximate Treatment and Plow Time Frame

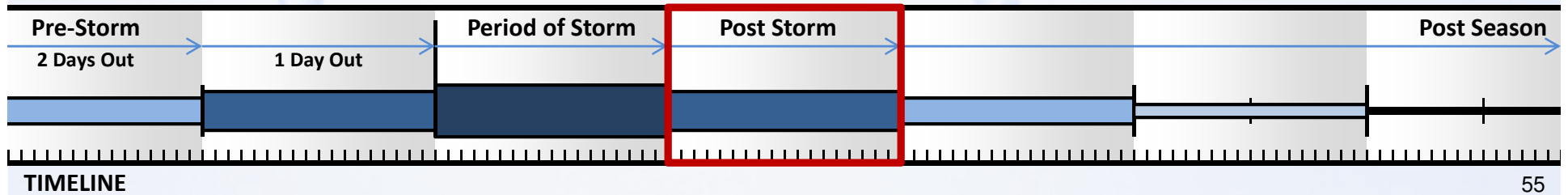
- After a storm has ended, crews continue operations with the following completion expectations



- Type of snow, ambient temperatures, road temperatures and wind conditions will alter the time frames

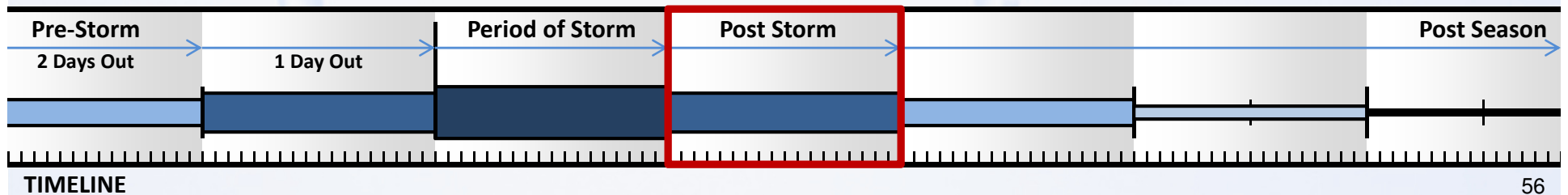


Demobilization



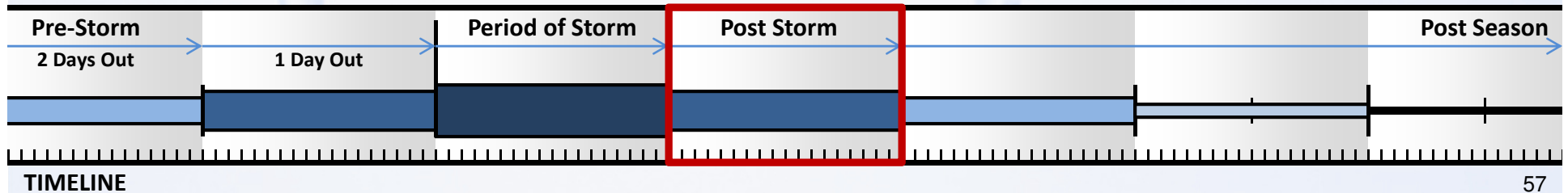
Tiered Demobilization

- Increase effectiveness and efficiencies
- Notification to other entities
- Careful assessment of countywide road conditions and weather forecast
- Reduce support as appropriate
- Scale back depot resources
- Activation of Lead Depot
- Conduct storm event debriefing



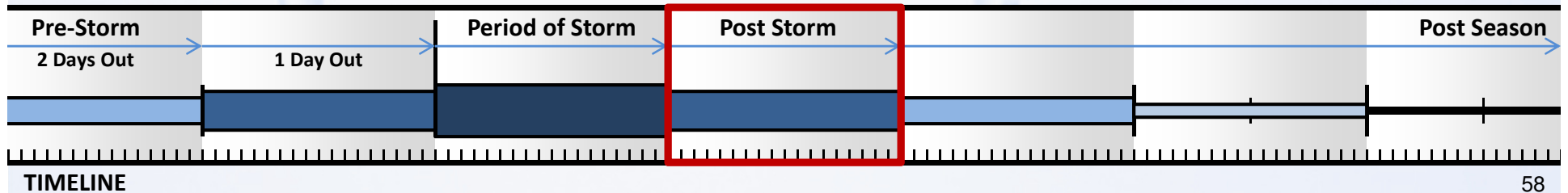
Post Storm Activities

- QA/QC storm cleanup
- Inspect storm drainage
- Replace mailbox knock downs (if any)
- Activate pot hole trucks
- Prepare for next storm...
- Risk management response

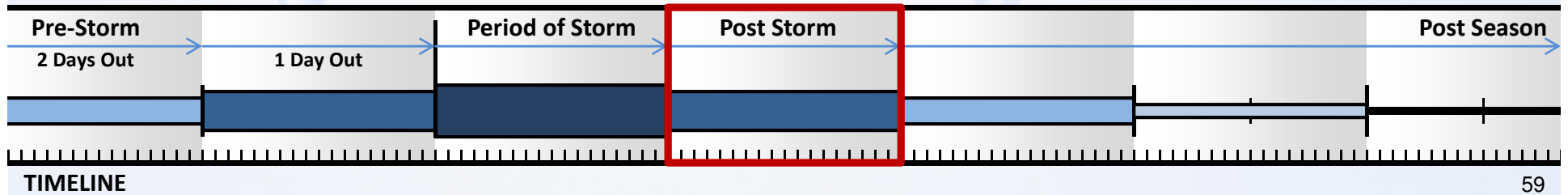


Stand Ready...

- Condition of equipment and facilities
- Status of county personnel
- Status of contract resources
- Material inventory
- Weather forecasts
 - Timing of next storm event (back-to-back storms)

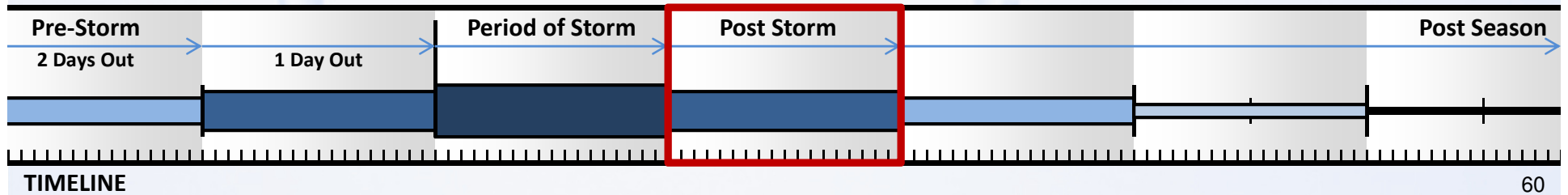


Post Storm Debriefing



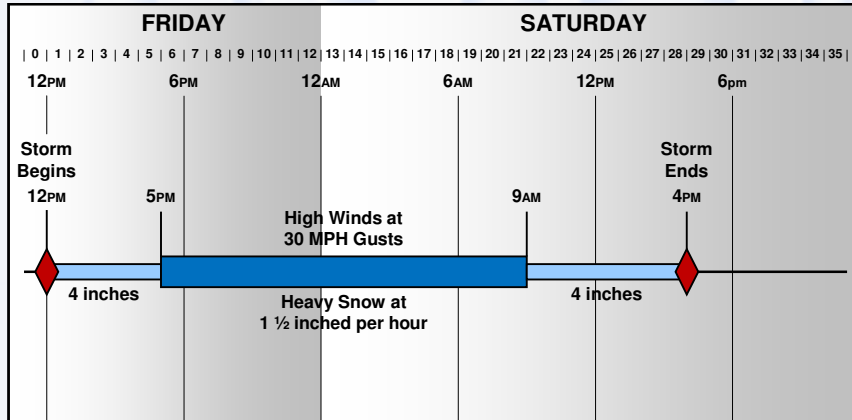
Debriefing

- Management
- District and Contract Supervisors
- Inspection staff and contractors
- MC311 Call Center
- Review customer feedback
- Self assessment

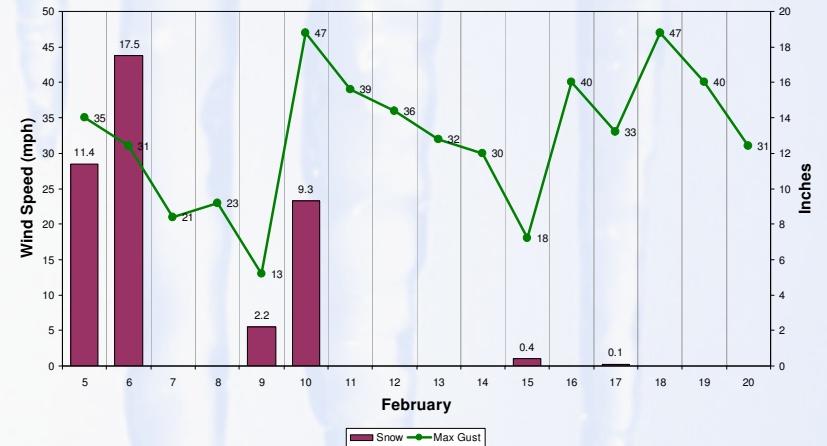


Debriefing

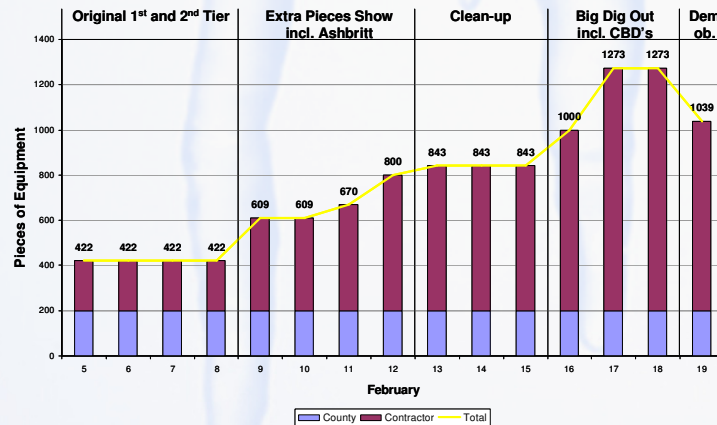
Timeline



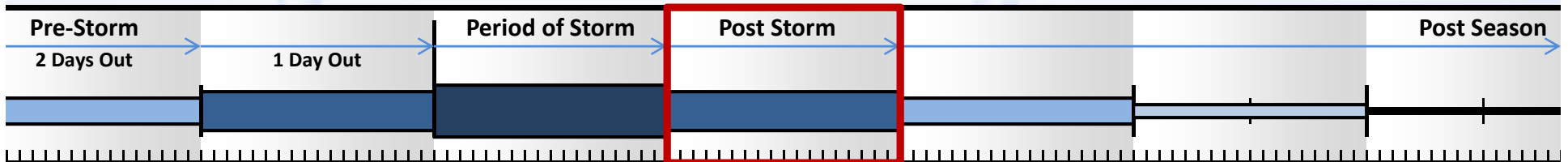
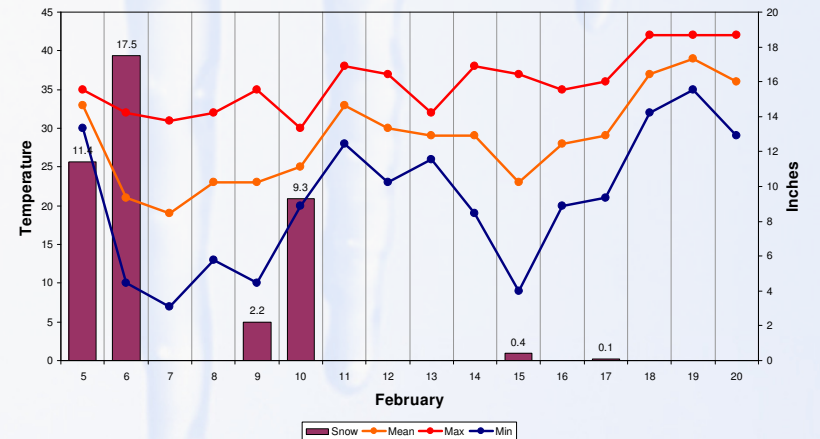
Snow and Wind



Equipment

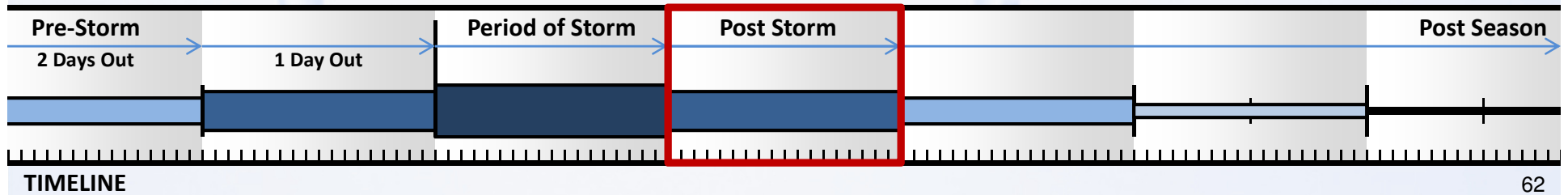


Snow and Temperatures



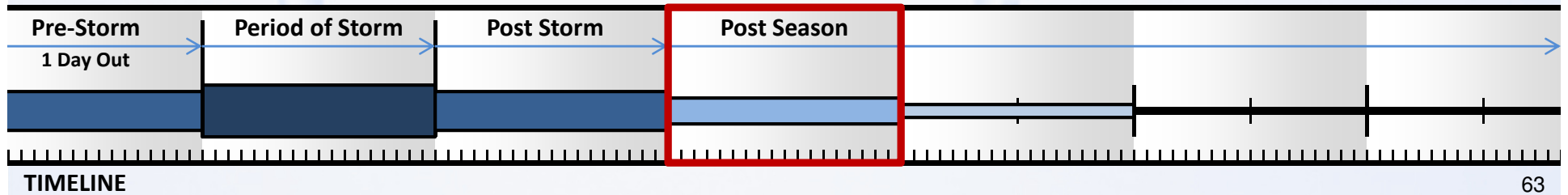
TIMELINE

Post Season



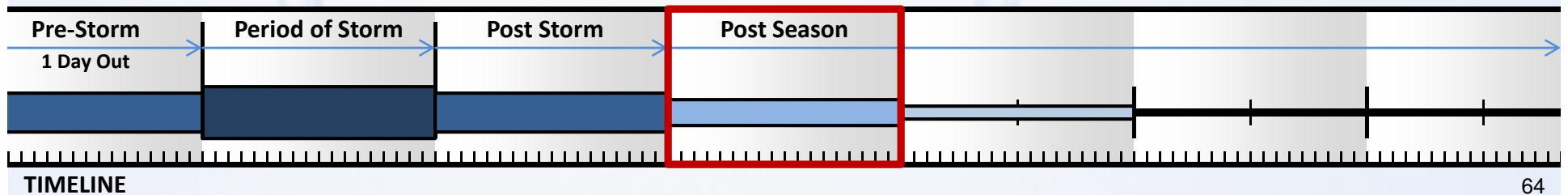
Why the Fuss?

- Why the fuss about a speedy snow clean-up?
- Who does it benefit?
- Is the cost of clean up worth the overall effort?
- After all, the snow will melt on its own, won't it?



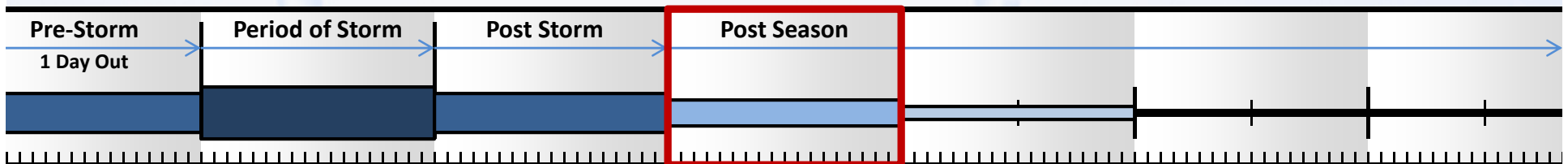
Economic Impacts

- According to a Global Insight study:
 - The economic impact of snow related closures far exceed the cost of timely snow removal.
 - The expenditure of upfront resources in the short-term, more than justifies the long-term payoff.
 - A one-day major snowstorm can cost a state \$300-\$700 million on both direct and indirect costs.



Winter Facts

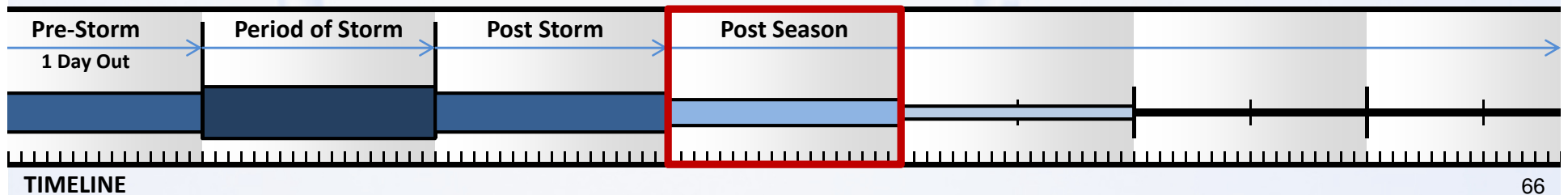
- Every winter, over 116,000 people are injured and over 1,300 are killed on America's highways due to snowy, slushy, or icy roads
- Nationally, snowstorms cost as much as \$700 million per day in lost economic activity
- It costs the Federal Government \$100 million per day to shutdown



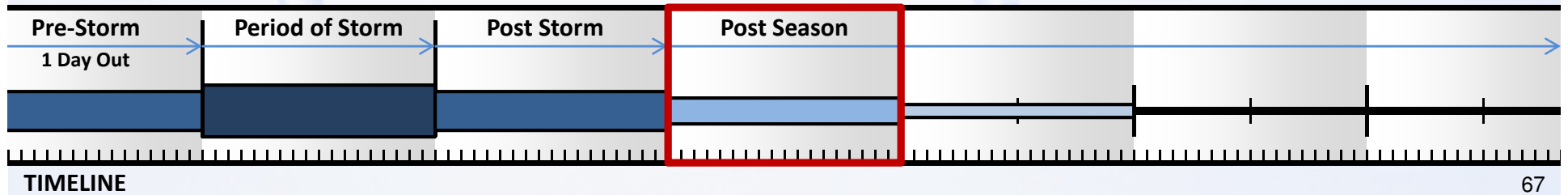
TIMELINE

Storm Forward Planning

- Global Objective
 - Emergency Access
 - Ensure main road conditions for ALL Emergency Services
 - All out effort by all field positions until such time as all county roads in a safe and passable condition
 - Effective storm operations relates to intangible benefits such as quality and equity of service
- Plan for the worst and hope for the best

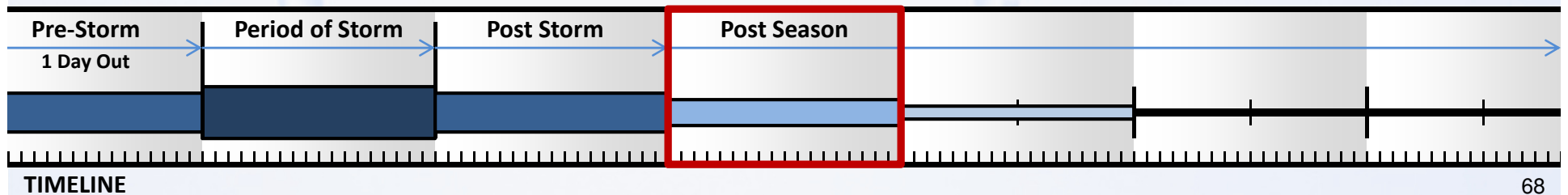


Post Season Debriefing



Debrief Last Season

- Examine efficiencies
- Examine shortcomings
- Review GIS (missed streets)
 - Completed review of county maintained streets
- Rate contractors
- Assess communications
- Consider all feedback (negative and positive)
- Develop a “Self Rating”





Wrap-up

Wrap-up

- When it snows like crazy...
- When the wind blows fiercely...
- When faced with a terrible blizzard...
- We clean it up!!!!!!!
- Remind drivers that:

“IN ICE AND SNOW...TAKE IT SLOW.”

Thanks to all Attendees:

- There is no better time than the present to express our appreciation for your support.
- The Montgomery County Department of Transportation's Division of Highway Services thanks everyone for making a difference towards our winter snow plowing and removal operations.

Questions & Answers

